SONY

3-865-332-**11** (1)

Video Camera Recorder

Operating Instructions

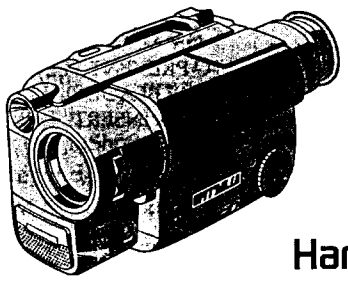
Before operating the unit, please read this manual thoroughly, and retain it for future reference.

Owner's Record

The model and serial numbers are located on the bottom. Record the serial number in the space provided below. Refer to these numbers whenever you call upon your Sony dealer regarding this product.

Model No. **CCD-TR** _____ Model No. **AC-L** _____

Serial No. _____ Serial No. _____



Handycam

video Hi8
CCD-TR516/TR716 **Hi8**

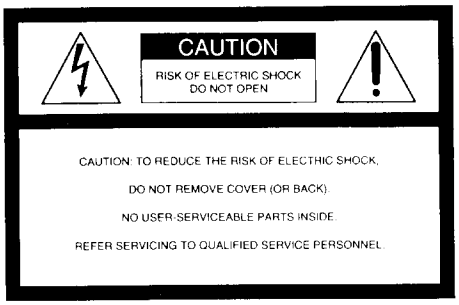
©1998 by Sony Corporation

Welcome!

Congratulations on your purchase of this Sony Handycam® camcorder. With your Handycam, you can capture life's precious moments with superior picture and sound quality. Your Handycam is loaded with advanced features, but at the same time it is very easy to use. You will soon be producing home video that you can enjoy for years to come.

WARNING

To prevent fire or shock hazard, do not expose the unit to rain or moisture.


CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN
CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK,
DO NOT REMOVE COVER (OR BACK).
NO USER-SERVICEABLE PARTS INSIDE.
REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

This symbol is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

This symbol is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

Never expose the battery pack to temperatures above 140°F (60°C), such as in a car parked in the sun or under direct sunlight.

DISPOSAL OF LITHIUM ION BATTERY.

LITHIUM ION BATTERY. DISPOSE OF PROPERLY.

You can return your unwanted lithium ion batteries to your nearest Sony Service Center or Factory Service Center.

Note: In some areas the disposal of lithium ion batteries in household or business trash may be prohibited.

For the Sony Service Center nearest you call 1-800-222-SONY (United States only)
For the Sony Factory Service Center nearest you call 416-499-SONY (Canada only)

Caution: Do not handle damaged or leaking lithium ion battery.

For the customers in the U.S.A.

CAUTION

You are cautioned that any changes or modifications not expressly approved in this manual could void your authority to operate this equipment.

Note:

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

For the customers in CANADA

CAUTION

TO PREVENT ELECTRIC SHOCK, MATCH WIDE BLADE OF PLUG TO WIDE SLOT, FULLY INSERT.

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Using this manual

The instructions in this manual are for the two models listed below. Before you start reading this manual and operating the unit, check your model number by looking at the bottom of your camcorder. The CCD-TR716 is the model used for illustration purposes. Otherwise, the model name is indicated in the illustrations. Any differences in operation are clearly indicated in the text, for example, "CCD-TR716 only."
As you read through this manual, buttons and settings on the camcorder are shown in capital letters.
e.g. Set the POWER switch to CAMERA.
You can hear the beep sound to confirm your operation.

Types of differences

CCD-	TR516	TR716
Steadyshot	—	●

Note on TV color systems

TV color systems differ from country to country. To view your recordings on a TV, you need an NTSC system-based TV.

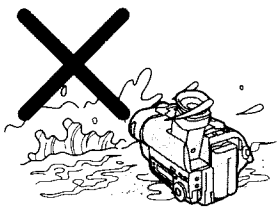
Precaution on copyright

Television programs, films, video tapes, and other materials may be copyrighted. Unauthorized recording of such materials may be contrary to the provision of the copyright laws.

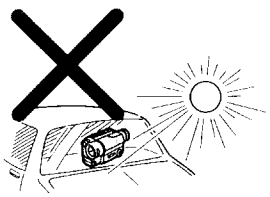
Precautions on camcorder care

- **The color viewfinder is manufactured using high-precision technology. However there may be some tiny black points and/or bright points (red, blue or green in color) that constantly appear in the viewfinder. These points are normal in the manufacturing process and do not affect the recorded picture in any way. Over 99.99% are operational for effective use.**
- Do not let the camcorder get wet. Keep the camcorder away from rain and sea water. Letting the camcorder get wet may cause the unit to malfunction, and sometimes this malfunction cannot be repaired **[a]**.
- Never leave the camcorder exposed to temperatures above 140°F (60°C), such as in a car parked in the sun or under direct sunlight **[b]**.

[a]

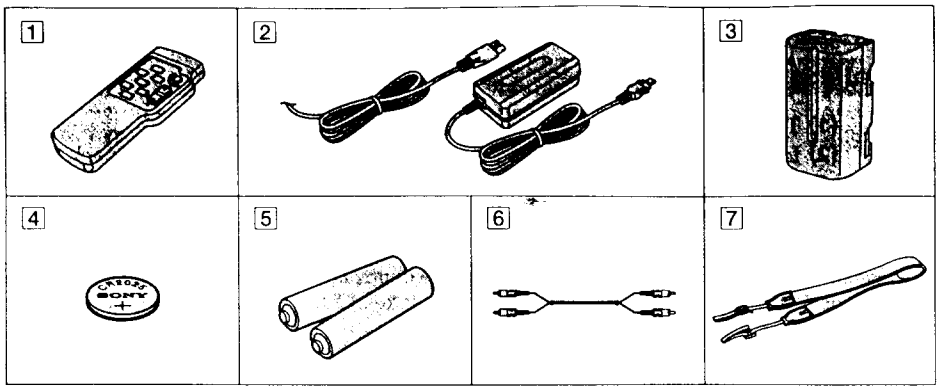


[b]



Checking supplied accessories

Check that the following accessories are supplied with your camcorder.



1 **Wireless Remote Commander** (1) (p. 72)

2 **AC-L10A/L10B/L10C AC power adaptor** (1), **Power cord** (1) (p. 7, 21)

3 **NP-F330 Battery pack** (1) (p. 6, 21)

4 **CR2025 Lithium Battery** (1) (p. 50)
The lithium battery is already installed in your camcorder.

5 **Size AA (R6) battery for Remote Commander** (2) (p. 72)

6 **A/V connecting cable** (1) (p. 18)

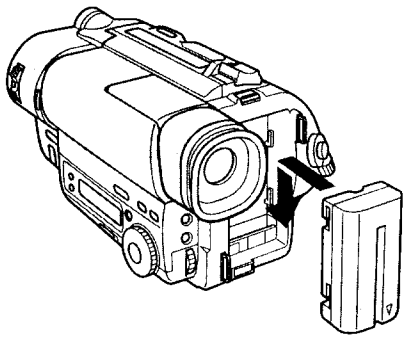
7 **Shoulder strap** (1) (p. 73)

Contents of the recording cannot be compensated if recording or playback is not made due to a malfunction of the camcorder, video tape, etc.

Before using your camcorder, you first need to install and charge the battery pack. This camcorder operates only with the "InfoLITHIUM" battery pack (L series). "InfoLITHIUM" is a trademark of Sony corporation.

Installing the battery pack

(1) Take off the attachment on the battery mounting surface.
(2) Install the battery pack in the direction of the ▼ mark on the battery pack. Slide the battery pack down until it catches on the battery release lever and clicks. Attach the battery pack to the camcorder securely.



Note on the battery pack
Do not carry the camcorder by grasping the battery pack.

Charging the battery pack

Charge the battery pack on a flat surface without vibration. The battery pack is charged a little in the factory.

(1) Open the DC IN jack cover and connect the supplied AC power adaptor to the DC IN jack with the plug's ▲ mark up.

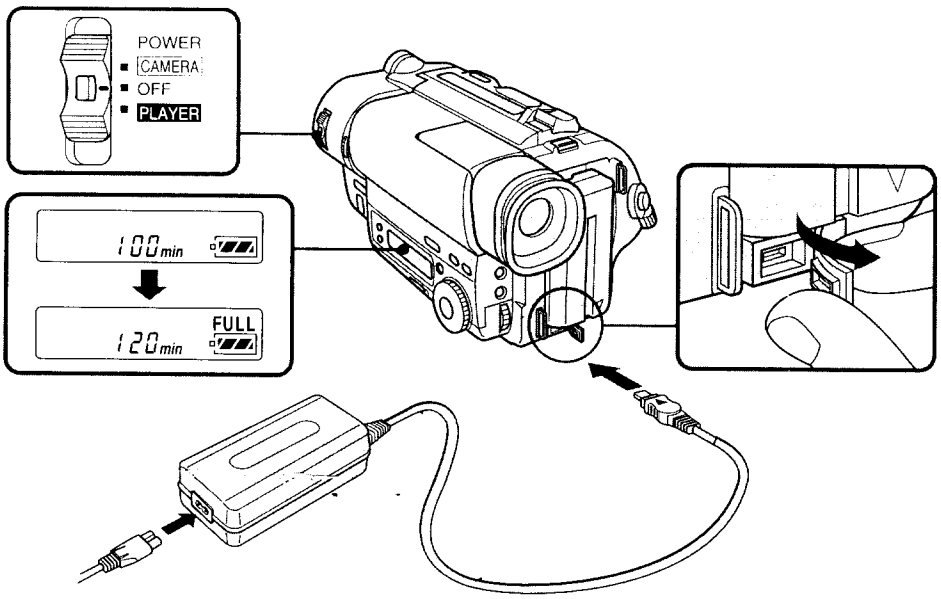
(2) Connect the power cord to the AC power adaptor.

(3) Connect the power cord to a wall outlet.

(4) Slide the POWER switch to OFF. Remaining battery time is indicated by the minutes on the display window. Charging begins.

When the remaining battery indicator becomes ▬, **normal charge** is completed. For **full charge**, which allows you to use the battery longer than usual, leave the battery pack attached for about 1 hour after normal charge is completed until **FULL** appears in the display window.

Before using the camcorder with the battery pack, unplug the AC power adaptor from the DC IN jack of the camcorder. You can also use the battery pack before it is completely charged.



Notes

- "--- min" appears on the display until the camcorder calculates remaining battery time.
- Remaining battery time indication in the display window roughly indicates the recording time. Use it as a guide. It may differ from the actual recording time.

Charging time

Battery pack (NP-)	F330 (supplied)	F530 F550	F730 F730H/F750	F930 F950
Charging time* (min.)	150 (90)	210 (150)	300 (240)	390 (330)

The time required for a normal charge is indicated in parentheses.

* Approximate minutes to charge an empty battery pack using the supplied AC power adaptor. (Lower temperatures require a longer charging time.)

Battery life

CCD-TR516

Battery pack (NP-)	F330 (supplied)	F530	F550	F730	F730H /F750	F930	F950
Continuous recording time*	135 (120)	235 (210)	270 (240)	475 (425)	550 (500)	745 (670)	850 (760)
Typical recording time**	70 (60)	120 (110)	140 (125)	250 (235)	290 (265)	390 (355)	450 (400)

CCD-TR716

Battery pack (NP-)	F330 (supplied)	F530	F550	F730	F730H /F750	F930	F950
Continuous recording time*	130 (115)	225 (200)	260 (230)	450 (405)	530 (480)	710 (640)	815 (730)
Typical recording time**	65 (60)	115 (105)	135 (120)	235 (210)	280 (250)	375 (335)	430 (385)

Numbers in parentheses indicate the time when you use a normally charged battery. Battery life will be shorter if you use the camcorder in a cold environment.

* Approximate continuous recording time at 77°F (25°C).

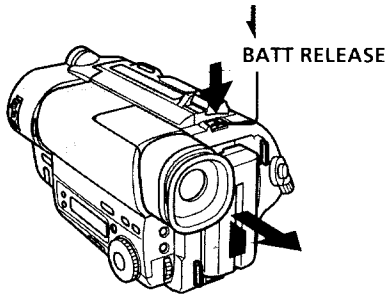
** Approximate minutes when recording while you repeat recording start/stop, zooming and turning the power on/off. The actual battery life may be shorter.

Note on remaining battery time indication during recording

Remaining battery time is displayed in the viewfinder. However, the indication may not be displayed properly, depending on using conditions and circumstances.

To remove the battery pack

While pressing BATT RELEASE, slide the battery pack in the direction of the arrow.



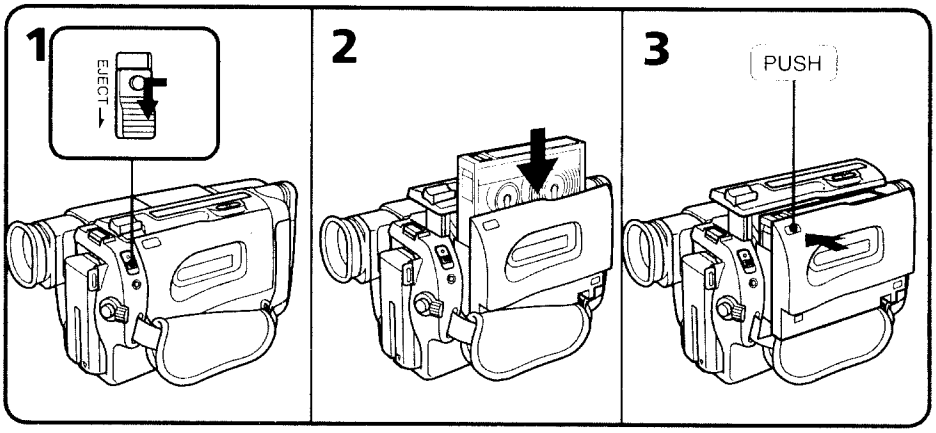
You can look at the demonstration of the functions available with this camcorder (p. 25).

Make sure that the power source is installed. When you want to record in the Hi8 system, use Hi8 video cassette **Hi8**.

(1) While pressing the small blue button on the EJECT switch, slide it in the direction of the arrow. The cassette compartment automatically lifts up and opens.

(2) Insert a cassette with the window facing out.

(3) Close the cassette compartment by pressing the "PUSH" mark on the cassette compartment. The cassette compartment automatically goes down.



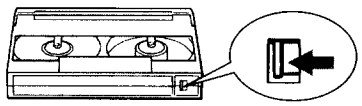
To eject the cassette

While pressing the small blue button on the EJECT switch, slide it in the direction of the arrow.

To prevent accidental erasure

Slide the tab on the cassette to expose the red mark. If you insert the cassette with the red mark exposed and close the cassette compartment, the beeps sound for a while. If you try to record with the red mark exposed, the [⊘] and ⏏ indicators flash, and you cannot record.

To re-record on this tape, slide the tab back out covering the red mark.



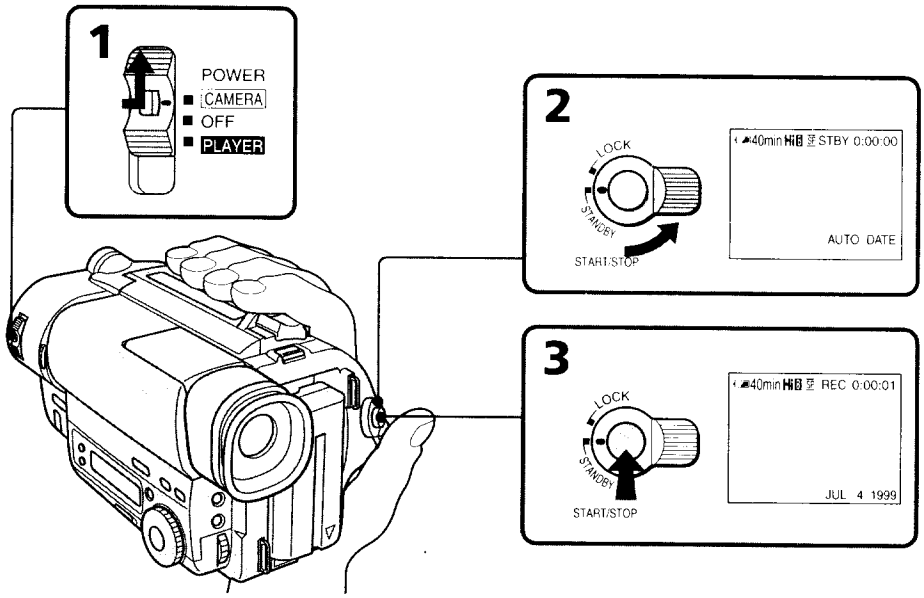
Camera Recording

Make sure that the power source is installed and a cassette is inserted and that the START/STOP MODE switch is set to . Before you record one-time events, you may want to make a trial recording to make sure that the camcorder is working correctly. When you use the camcorder for the first time, power on it and reset the date and time to your time before you start recording (p. 52). The date is automatically recorded for 10 seconds after you start recording **(AUTO DATE feature)**. This feature works only once a day.

(1) While pressing the small green button on the POWER switch, set it to CAMERA.

(2) Turn STANDBY up to STANDBY.

(3) Press START/STOP. The camcorder starts recording. The "REC" indicator appears. The camera recording/battery lamp located on the front of the camcorder also lights up.



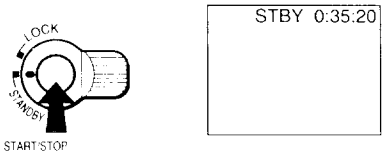
To stop recording momentarily [a]

Press START/STOP again. The "STBY" indicator appears in the viewfinder **(Standby mode)**.

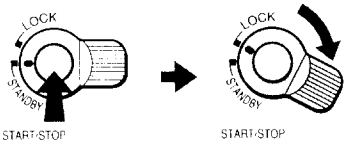
To finish recording [b]

Press START/STOP again. Turn STANDBY down to LOCK and set the POWER switch to OFF. Then, eject the cassette.

[a]



[b]

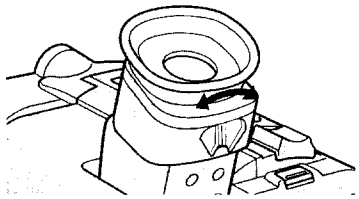


Note

Be sure to remove the battery pack from the camcorder after using.

To focus the viewfinder lens

If you cannot see the indicators in the viewfinder clearly, focus the viewfinder lens. Move the viewfinder lens adjustment lever so that the indicators in the viewfinder come into sharp focus.



Note on Standby mode

If you leave the camcorder in Standby mode for 5 minutes while the cassette is inserted, the camcorder turns off automatically for saving battery power as well as for preventing the battery and tape from wearing down. To resume Standby mode, turn STANDBY down and up again. To start recording, press START/STOP.

Note on recording

When you record from the beginning of a tape, run the tape for about 15 seconds before starting the actual recording. Passing the tape lead will ensure that you will not miss any start-up scenes when you play back the tape.

Notes on the tape counter

- The tape counter indicates the recording or playback time. Use it as a guide. There will be a time lag of several seconds from the actual time. To set the counter to zero, press COUNTER RESET.
- If the tape is recorded in SP and LP modes mixed, the tape counter shows incorrect recording time. When you intend to edit the tape using the tape counter as a guide, record in same (SP or LP) mode.

Note on the beep sound

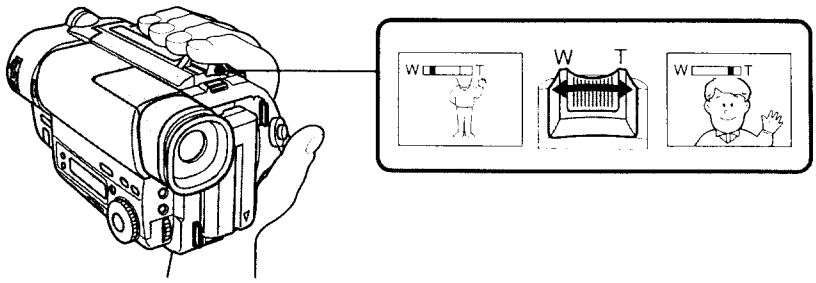
The beep sounds when you operate the camcorder. Several beeps also sound as a warning of any unusual condition of the camcorder.
Note that the beep sound is not recorded on the tape. If you do not want to hear the beep sound, select "OFF" in the menu system.

Note on the AUTO DATE feature

The clock is set to East Coast Standard Time at the factory. You can reset the clock in the menu system. You can change the AUTO DATE settings by selecting ON or OFF in the menu system. The AUTO DATE feature shows the date automatically once a day. However, the date may automatically appear more than once a day when:
- you reset the date and time.
- you eject and insert the tape again.
- you stop recording within 10 seconds.
- you set AUTO DATE to OFF once and set it to ON again in the menu system.

Using the zoom feature

Zooming is a recording technique that lets you change the size of the subject in the scene.
For more professional-looking recordings, use the zoom function sparingly.
"T" side: for telephoto (subject appears closer)
"W" side: for wide-angle (subject appears further away)



Zooming speed (Variable speed zooming)

Move the power zoom lever a little for a slower zoom, move it further for a faster zoom.

When you shoot a subject using a telephoto zoom

If you cannot get a sharp focus while in extreme telephoto zoom, move the power zoom lever to the "W" side until the focus is sharp. You can shoot a subject that is at least about 2 5/8 feet (about 80 cm) away from the lens surface in the telephoto position, or about 1/2 inch (about 1 cm) away in the wide-angle position.

Zooming more than 18x – digital zoom

When you set D ZOOM to ON in the menu system, more than 18x zoom is performed digitally, but the picture quality deteriorates as you move the lever toward the "T" side.

Notes on digital zoom

- The right side **[a]** of the power zoom indicator shows the digital zooming zone, and the left side **[b]** shows the optical zooming zone. When you set D ZOOM to ON in the menu system, the **[a]** zone appears.
- Digital zoom function is set to OFF at the factory.

Selecting the START/STOP mode

Your camcorder has three modes. These modes enable you to take a series of quick shots resulting in a lively video.

(1) Set START/STOP MODE to the desired mode.

: Recording starts when you press START/STOP, and stops when you press it again (factory setting).

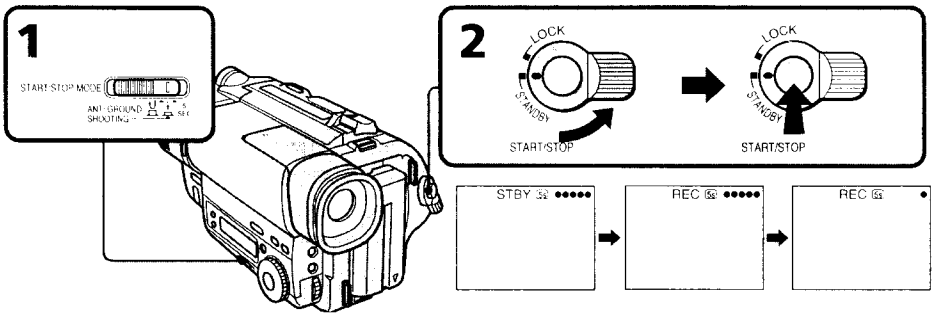
ANTI GROUND SHOOTING : The camcorder records only while you press down START/STOP so that you can avoid recording unnecessary scenes.

5SEC: When you press START/STOP, the camcorder records for 5 seconds and then stops automatically.

(2) Turn STANDBY up to STANDBY and press START/STOP.

Recording starts.

If you selected 5SEC, the tape counter disappears and five dots appear. The dots disappear at a rate of one per second as illustrated below.



To extend the recording time in 5SEC mode

Press START/STOP again before all the dots disappear. Recording continues for about 5 seconds from the moment you press START/STOP.

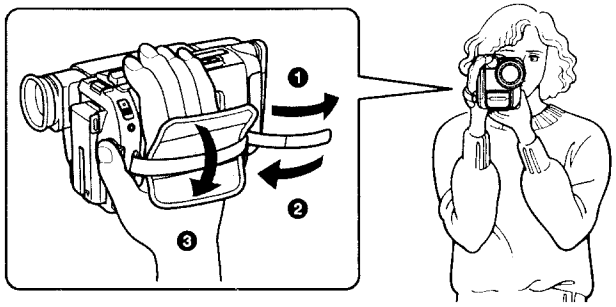
Note on START/STOP mode

You cannot use the fader function in the 5SEC or ANTI GROUND SHOOTING mode.

For hand-held shots, you'll get better results by holding the camcorder according to the following suggestions:

- Hold the camcorder firmly and secure it with the grip strap so that you can easily manipulate the controls with your thumb **[a]**.
- Place your right elbow against your side.
- Place your left hand under the camcorder to support it. Be sure to not touch the built-in microphone.
- Place your eye firmly against the viewfinder eyecup.
- Use the viewfinder frame as a guide to determine the horizontal plane.
- You can also record in a low position to get an interesting angle. Lift the viewfinder up for recording from a low position **[b]**.

[a]



[b]

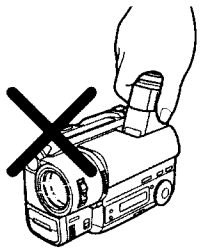
Place the camcorder on a flat surface or use a tripod

Try placing the camcorder on a table top or any other flat surface of suitable height. If you have a tripod for a still camera, you can also use it with the camcorder.
When attaching a non-Sony tripod, make sure that the length of the tripod screw is less than 9/32 inch (6.5 mm). Otherwise, you cannot attach the tripod securely and the screw may damage the camcorder.

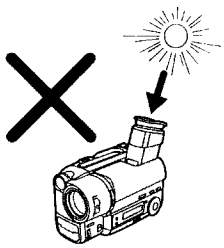
Cautions on the viewfinder

- Do not pick up the camcorder by the viewfinder **[c]**.
- Do not place the camcorder so as to point the viewfinder toward the sun. The inside of the viewfinder may be damaged. Be careful when placing the camcorder under sunlight or by a window **[d]**.

[c]



[d]



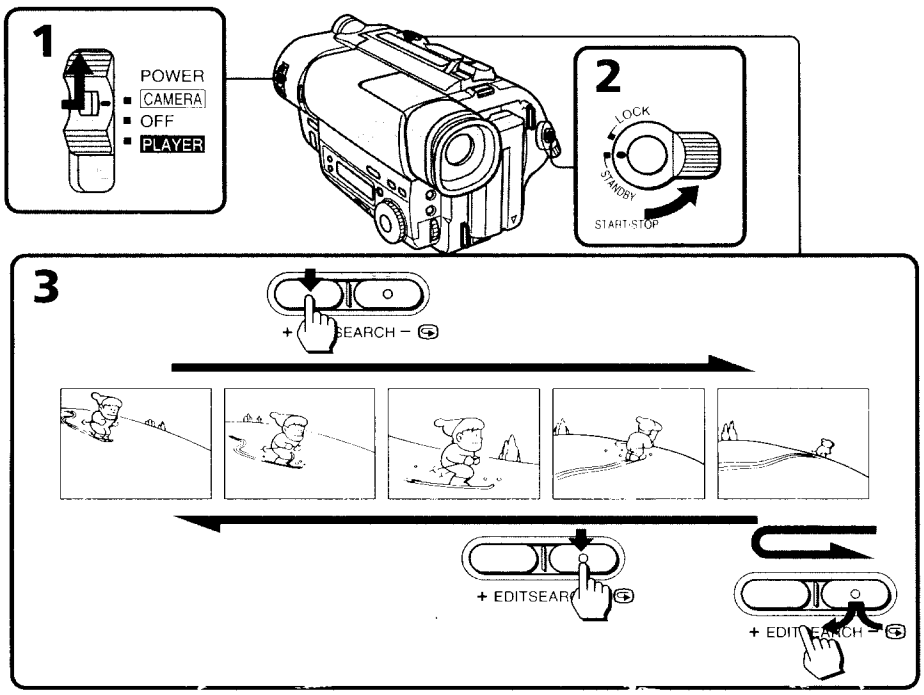
Checking the recorded picture

Using EDITSEARCH, you can review the last recorded scene or check the recorded picture in the viewfinder.

(1) While pressing the small green button on the POWER switch, set it to CAMERA.

(2) Turn STANDBY up to STANDBY.

(3) Press the – (⏪) side of EDITSEARCH momentarily; the last few seconds of the recorded portion play back **(Rec Review)**.
Hold down the – side of EDITSEARCH until the camcorder goes back to the scene you want. The last recorded portion is played back. To go forward, hold down the + side **(Edit Search)**.



To stop playback

Release EDITSEARCH.

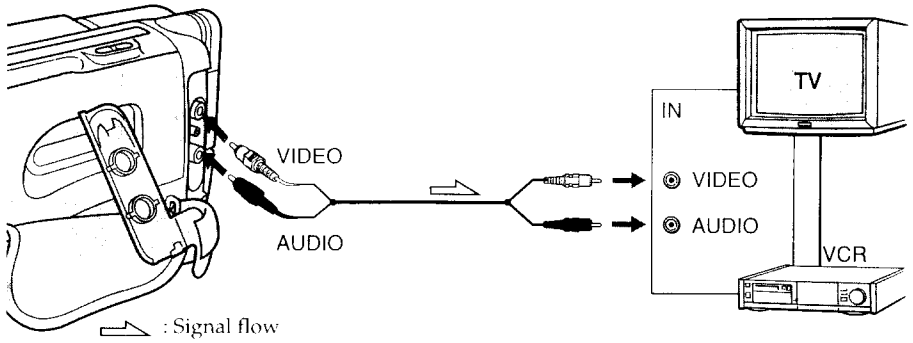
To begin re-recording

Press START/STOP. Re-recording begins from the point you released EDITSEARCH. Provided you do not eject the cassette, the transition between the last scene you recorded and the next scene you record will be smooth.

Connect the camcorder to your TV or VCR to watch the playback picture on the TV screen. When monitoring the playback picture by connecting the camcorder to your TV we recommend you to use house current for the power source.

Connecting directly to a TV/VCR with Video/Audio input jacks

When connecting the A/V connecting cable, make sure you connect the plug to jacks of the same color.
Open the jack cover. With using the supplied A/V connecting cable, connect the camcorder to the LINE IN inputs on the TV or VCR connected to the TV. Set the TV/VCR selector on the TV to VCR. When connecting to the VCR, set the input selector on the VCR to LINE.

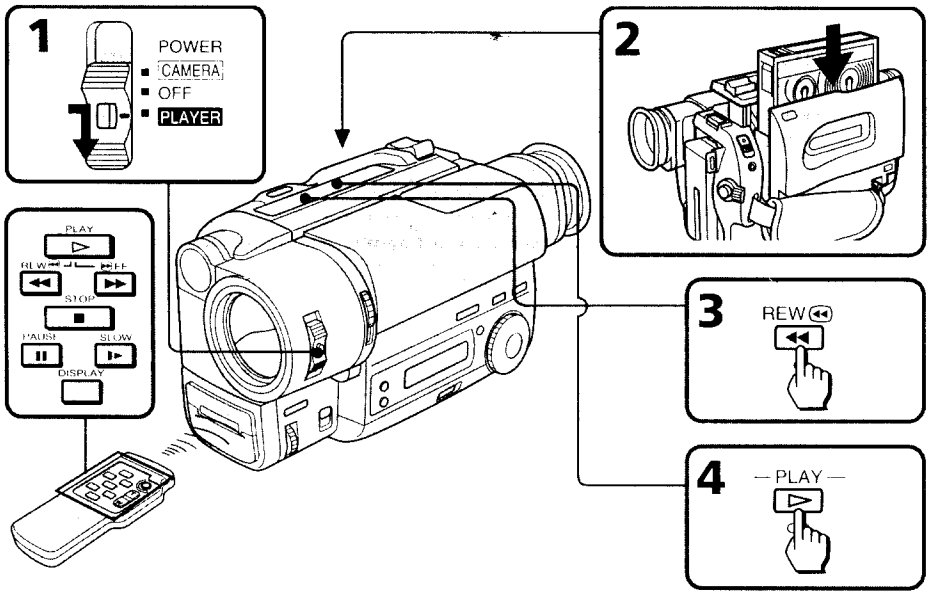


To connect to a TV or VCR without Video/Audio input jacks
Use an NTSC type RFU adaptor (not supplied).

Playing back a tape

You can monitor the playback picture in the viewfinder. You can also monitor the picture on a TV screen, after connecting the camcorder to a TV or VCR.

(1) While pressing the small green button on the POWER switch, set it to PLAYER.
(2) Insert the recorded tape with the window facing out.
(3) Press ◄◄ to rewind the tape.
(4) Press ► to start playback.



To stop playback, press ■.
To rewind the tape, press ◄◄.
To fast-forward the tape rapidly, press ►►.

Using the remote commander

You can control playback using the supplied Remote Commander. Before using the Remote Commander, insert the size AA (R6) batteries.

To display the viewfinder screen indicators on the TV

Press DISPLAY on the Remote Commander. To erase the indicators, press DISPLAY again.

Note on the lens cover

The lens cover does not open when the POWER switch is set to PLAYER. Do not open the lens cover manually. It may cause malfunction.

Various playback modes

To view a still picture (playback pause)

Press II during playback. To resume playback, press II or ►.

To locate a scene (picture search)

Keep pressing ◄◄ or ►► during playback. To resume normal playback, release the button.

To monitor the high-speed picture while advancing the tape or rewinding (skip scan)

Keep pressing ◄◄ while rewinding or ►► while advancing the tape. To resume normal playback, press ►.

To view the picture at 1/5 speed (slow playback)

Press I► on the Remote Commander during playback. To resume normal playback, press ►. If slow playback lasts for about 1 minute, it shifts to normal speed automatically.

Notes on playback

- Noise may appear when you use the still/slow/picture search function to play back the tape recorded in LP mode.
- Streaks appear and the sound is muted in the various playback modes.
- When playback pause mode lasts for 5 minutes, the camcorder automatically enters stop mode.

Using alternative power sources

You can choose any of the following power sources for your camcorder: battery pack, house current, alkaline batteries and 12/24 V car battery. Choose the appropriate power source depending on where you want to use your camcorder.

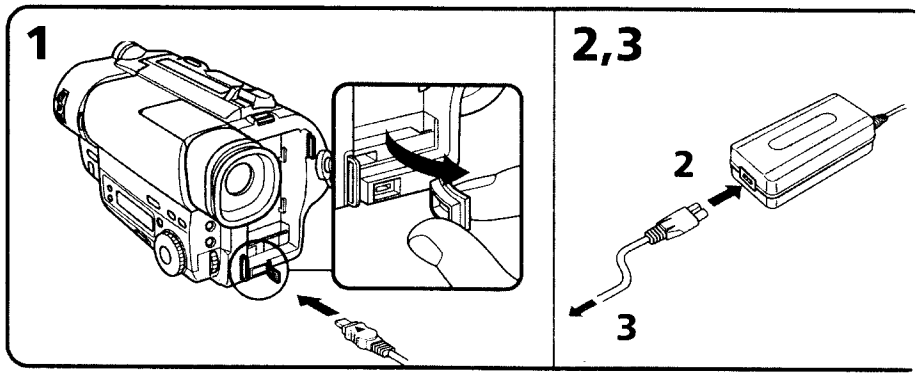
Place	Power source	Accessory to be used
Indoors	House current	Supplied AC power adaptor
Outdoors	Battery pack	Battery pack NP-F330 (supplied), NP-F530, NP-F550, NP-F730, NP-F730H, NP-F750, NP-F930, NP-F950
In the car	12 V or 24 V car battery	Sony DC adapter/charger DC-V700 (not supplied)

Notes on power sources

- Disconnecting the power source or removing the battery pack during recording or playback may damage the inserted tape.
- The DC IN jack has power source priority. This means that the battery pack cannot supply any power if the power cord is connected to the DC IN jack, even when the power cord is not plugged into the wall outlet.

Using the house current

(1) Open the DC IN jack cover, and connect the AC power adaptor to the DC IN jack on the camcorder.
(2) Connect the power cord to the AC power adaptor.
(3) Connect the power cord to a wall outlet.



WARNING
The power cord must only be changed at a qualified service shop.

PRECAUTION
The set is not disconnected from the AC power source (house current) as long as it is connected to the wall outlet, even if the set itself has been turned off.

Note
Keep the AC power adaptor away from the camcorder if the picture is disturbed.

This mark indicates that this product is a genuine accessory for Sony video products.
When purchasing Sony video products, Sony recommends that you purchase accessories with this "GENUINE VIDEO ACCESSORIES" mark.

Changing the mode settings

You can change the mode settings in the menu system to further enjoy the features and functions of the camcorder.

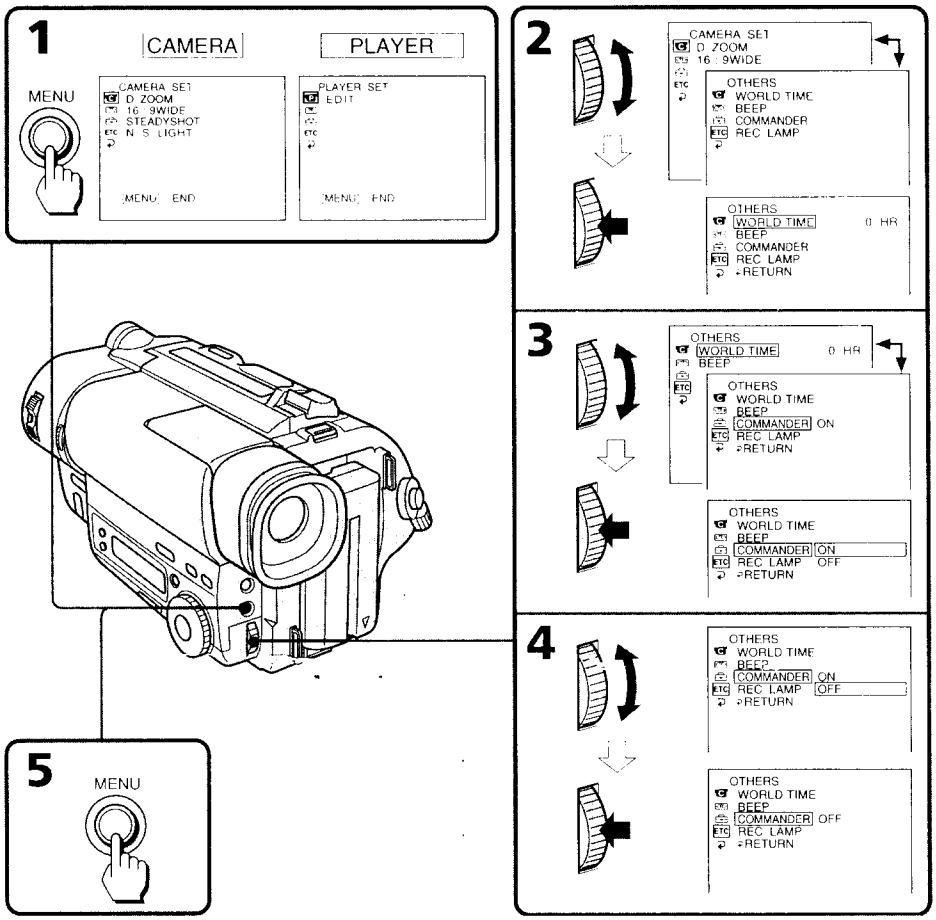
(1) Press MENU to display the menu.

(2) Turn the control dial to select the desired icon in the left side of the menu, then press the dial to set.

(3) Turn the control dial to select the desired item, then press the dial to set.

(4) Turn the control dial to select the desired mode, and press the dial to set. If you want to change the other modes, repeat steps 3 and 4. If you want to change the other items, select ⮌ RETURN and press the dial, then repeat steps from 2 to 4.

(5) Press MENU or select ⮌ icon to erase the menu display.



Note on the menu display

Depending on the model of your camcorder, the menu display may be different from that in this illustration.

Note on changing the mode setting

Menu items differ depending on the setting of the POWER switch to PLAYER or CAMERA.

Selecting the mode setting of each item

Items for both CAMERA and PLAYER modes

REMAIN* <AUTO/ON>

- Select AUTO when you want to display the remaining tape bar:
  - for about 8 seconds after the camcorder turns on and calculates the remainder of the tape.
  - for about 8 seconds after a cassette is inserted and the camcorder calculates the remainder of the tape.
  - for the period of tape rewinding, forwarding or picture search in PLAYER mode.
  - for about 8 seconds after ► is pressed in PLAYER mode.
  - for about 8 seconds after DISPLAY on the Remote Commander is pressed to display the screen indicator.
- Select ON to always display the remaining tape indicator.

LTR SIZE* <NORMAL/2x>

- Normally select NORMAL.
- Select 2x to display selected menu item by twice size of normal.

BEEP* <ON/OFF>

- Select ON so that beeps sound when you start/stop recording, etc.
- Select OFF when you do not want to hear the beep sound.

COMMANDER <ON/OFF>

- Select ON when using the supplied Remote Commander for the camcorder.
- Select OFF when not using the Remote Commander.

Items for CAMERA mode only

D ZOOM* <ON/OFF>

- Select ON to activate digital zooming.
- Select OFF to prevent the deterioration of the picture quality. The camcorder goes back to optical zoom.

16:9WIDE* <OFF/CINEMA/16:9FULL>

- Normally select OFF.
- Select CINEMA to record in CINEMA mode.
- Select 16:9FULL to record in 16:9FULL mode.

STEADYSHOT* <ON/OFF> (CCD-TR716 only)

- Normally select ON.
- Select OFF to release the SteadyShot function.

N.S.LIGHT* <ON/OFF>
- Normally select ON.
- Select OFF to not use the NightShot Light function.

REC MODE* <SP/LP>
- Select SP when recording in SP (standard play) mode.
- Select LP when recording in LP (long play) mode.

When a tape recorded on this camcorder in LP mode is played back on other types of 8mm camcorders or VCRs, the playback quality may not be as good as that on this camcorder.

Note on the REC mode

When you record tapes in LP mode, the picture is not recorded in the Hi8 system, but in the standard 8 mm system.

ORC TO SET*
Select this item to automatically adjust the recording condition to get the best possible recording.
If you have already performed this function, "ORC ON" is displayed.
ORC stands for "Optimizing the Recording Condition."

CLOCK SET*
Reset the date or time.

AUTO DATE* <ON/OFF>
- Select ON to record the date for 10 seconds after recording has started.
- Select OFF to not record the date.

DEMO MODE* <ON/OFF>
- Select ON to make the demonstration appear.
- Select OFF to deactivate the demonstration mode.

Notes on DEMO MODE

- DEMO MODE is set to STBY (Standby) at the factory and the demonstration starts about 10 minutes after you set the POWER switch to CAMERA without inserting a cassette.
  Note that you cannot select STBY of DEMO MODE in the menu system.
- You cannot select DEMO MODE when a cassette is inserted in the camcorder.
- If you insert a cassette during the demonstration, the demonstration stops. You can start recording as usual. DEMO MODE automatically returns to STBY.
- When NIGHTSHOT is set to ON, "NIGHTSHOT" appears in the viewfinder and the demonstration does not start.

To look at the demonstration at once

Eject the cassette, if inserted. Select ON of DEMO MODE and erase the menu display. The demonstration will begin.
When you turn off the camcorder once, DEMO MODE automatically returns to STBY.

ETC WORLD TIME*
Select this item to set the clock by a time difference.

ETC REC LAMP* <ON/OFF>
- Select OFF when you do not want the camera recording/battery lamp at the front of the unit to light up.
- Normally select ON.

Items for PLAYER mode only

EDIT <ON/OFF>
- Select ON to minimize picture deterioration when editing.
- Normally select OFF.

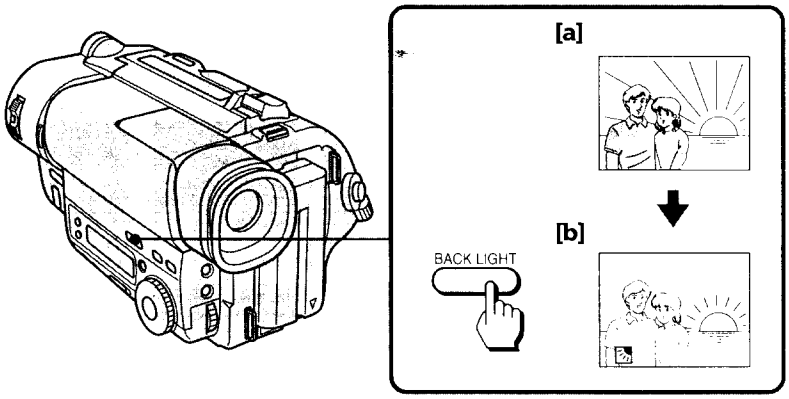
The EDIT setting works only during playback.

* These settings are retained even when the battery is removed, as long as the lithium battery is in place.

Shooting with backlighting

When you shoot a subject with the light source behind the subject or a subject with a light background, use the BACK LIGHT function.

Press BACK LIGHT. The ◪ indicator appears in the viewfinder.



[a] Subject is too dark because of backlight.
[b] Subject becomes bright with backlight compensation.

After shooting

Be sure to release this adjustment condition by pressing BACK LIGHT again. The ◪ indicator disappears. Otherwise, the picture will be too bright under normal lighting condition.

This function is also effective under the following conditions:

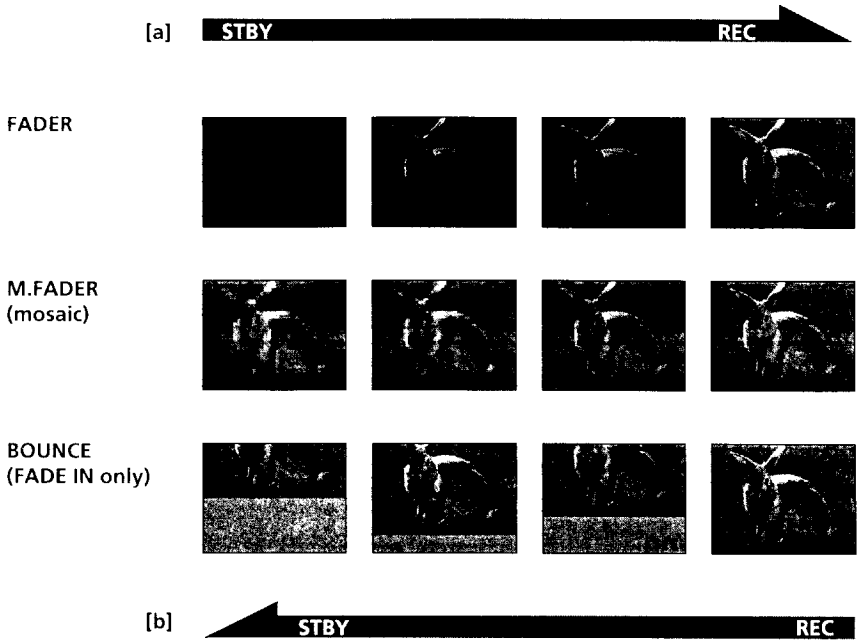
- A subject with a light source nearby or a mirror reflecting light
- A white subject against a white background. Especially when you shoot a person wearing shiny clothes made of silk or synthetic fiber, his or her face tends to become dark if you do not use this function.

To make a fine adjustment

You can adjust the exposure manually. However, when you adjust the exposure manually, you cannot operate the BACK LIGHT function.

Selecting the fader function

You can fade in or out to give your recording a professional appearance.
When the picture fades in, the sound gradually increases. When the picture fades out, the sound gradually decreases.



MONOTONE
When fading in, the picture gradually changes from black and white to color.
When fading out, the picture gradually changes from color to black and white.

Note
When D ZOOM in the menu system is set to ON, you cannot use the BOUNCE function.

Using the fader function

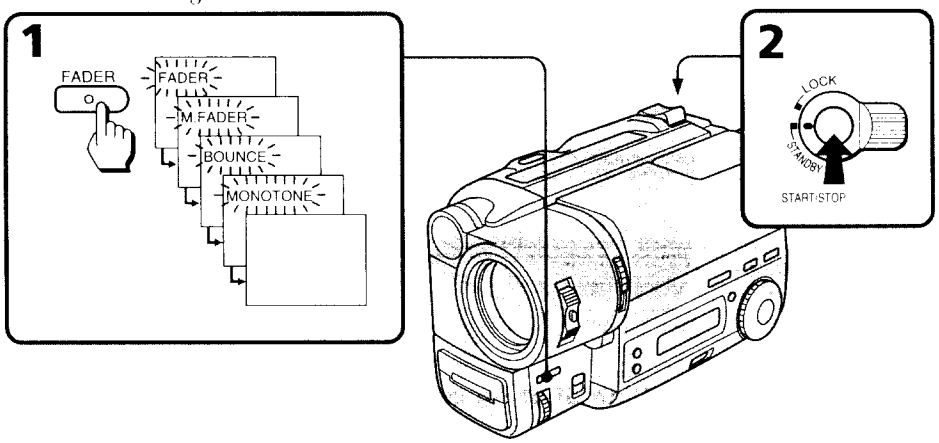
When fading in [a]

(1) While the camcorder is in Standby mode, press FADER until the desired fade indicator flashes.
(2) Press START/STOP to start recording. The fade indicator stops flashing.

When fading out [b]

(1) During recording, press FADER until the desired fade indicator flashes.
(2) Press START/STOP to stop recording. The fade indicator stops flashing, and then recording stops.

The fading mode selected last is indicated first of all.



When you use the BOUNCE function

Set D ZOOM to OFF in the menu system.

Note on the BOUNCE function

When you use the following functions, "BOUNCE" indicator does not appear.
- Wide mode
- Functions using the PICTURE EFFECT button
- Functions using the PROGRAM AE dial

To cancel the fader function

Before pressing START/STOP, press FADER until the indicator disappears.

When the date or time indicator and title are displayed

The date or time indicator and title do not fade in or fade out.

When the START/STOP MODE switch is set to 5SEC or ANTI GROUND SHOOTING

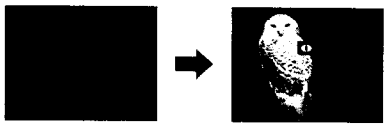
You cannot use the fader function.

Note on the fader function

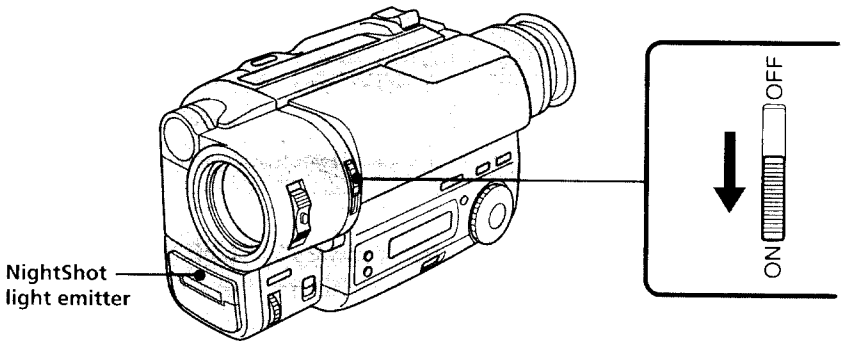
While using the BOUNCE function, you cannot use the following functions.
- Exposure
- Focus
- Zoom

Shooting in the dark (NightShot)

The NightShot function enables you to shoot a subject in a dark place. You can achieve a satisfactory recording of the ecology of nocturnal animals for observation with this function.



(1) While the camcorder is in Standby mode, slide NIGHTSHOT to ON.
(2) Press START/STOP to start recording.
📼 and "NIGHTSHOT" indicators flash.



To cancel the NightShot function

Slide NIGHTSHOT to OFF.

Using the NightShot light

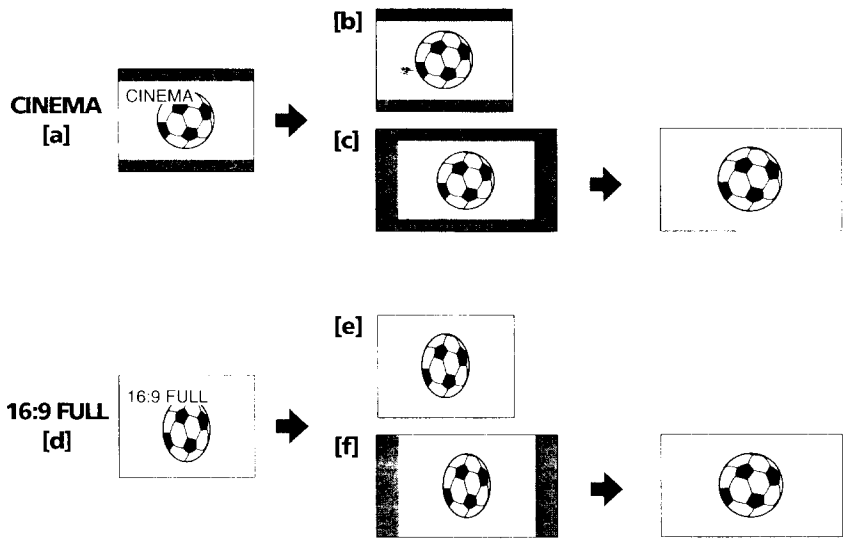
When you set N.S.LIGHT to ON in the menu system, the picture will be more clear. NightShot Light rays are infrared and are therefore invisible. The maximum limit of NightShot light is about 10 feet (about 3 m).

Notes on the NightShot

- Do not use the NightShot function in bright places (ex. outdoors). This may cause your camcorder to malfunction.
- The following functions are not operable when using the NightShot function.
  - PROGRAM AE
  - Exposure
- When you keep setting NIGHTSHOT to ON in normal recording, picture may be recorded in incorrect/unnatural color.
- If focusing is difficult with the autofocus mode when using the NightShot function, use manual focus.

Selecting the desired mode

You can record a cinemalike picture (CINEMA) or a 16:9 wide picture to watch on the 16:9 wide-screen TV (16:9 FULL).



CINEMA

Black bands appear at the top and the bottom of the screen, and the viewfinder **[a]** and a normal TV screen **[b]** look wide. You can also watch the picture without black bands on a wide-screen TV **[c]**.

16:9 FULL

The picture in the viewfinder **[d]** or on a normal TV **[e]** is horizontally compressed. You can watch the picture of normal images on a wide-screen TV **[f]**.

Using the wide mode function

You can select the wide mode (OFF, CINEMA, 16:9FULL) in the menu system (p. 24).

To cancel wide mode

Select OFF in the menu system.

To watch the tape recorded in wide mode

To watch the tape recorded in CINEMA mode, set the screen mode of the wide-screen TV to zoom mode. To watch the tape recorded in 16:9 FULL mode, set it to full mode. For details, refer to the operating instruction of your TV.
Note that the picture recorded in 16:9 FULL mode looks compressed on a normal TV.

Notes on wide mode

- If wide mode is set to 16:9FULL, the SteadyShot function does not work and the ☞ indicator flashes (CCD-TR716 only).
- In wide mode, you cannot select the BOUNCE function with FADER.
- When you record in 16:9 FULL mode, the date or time indicator will be widened on the wide-screen TV.
- If you dub a tape, the tape is copied in the same mode as the original recording.
- When recording, you cannot change the mode.

Selecting the best mode

You can select one of six PROGRAM AE (Auto Exposure) modes to suit your shooting situation, referring to the following.

Spotlight mode
For subjects in spotlight, such as at the theater or a formal event.

Soft Portrait mode
For zooming in on a still subject in telephoto mode, or for a subject behind an obstacle such as a screen. Creates a soft background for subjects such as people or flowers, and faithfully reproduces skin color.

Sports Lesson mode
For recording fast-moving subjects such as in tennis or golf games.

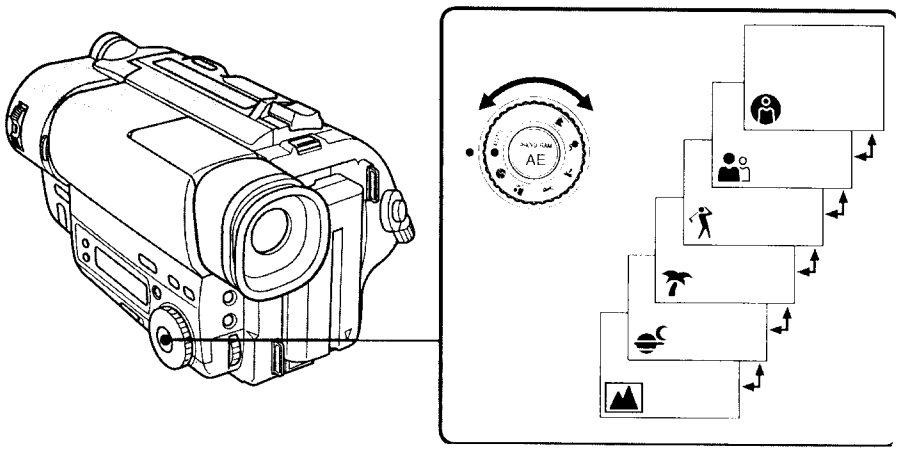
Beach & Ski mode
For people or faces in strong light or reflected light, such as at a beach in midsummer or on a ski slope.

Sunset & Moon mode
For recording subjects in dark environments such as sunsets, fireworks, neon signs, or general night views.

Landscape mode
For distant subjects such as mountains or when recording a subject behind an obstacle such as a window or screen.

Using the PROGRAM AE function

Turn the PROGRAM AE dial to select the desired PROGRAM AE mode.



To turn off PROGRAM AE

Turn the PROGRAM AE dial to the ● position.

Notes on focus setting

- In the Spotlight, Sports lesson and Beach & Ski modes, you cannot take close-ups because the camcorder is set to focus only on subjects in the middle to far distance.
- In the Sunset & Moon and Landscape modes, the camcorder is set to focus only on distant subjects.

Note on PROGRAM AE

Flickering or changes in color may occur in the following modes if recording is carried out under a discharge tube such as a fluorescent lamp, sodium lamp or mercury lamp. If this happens, turn off PROGRAM AE.

– Soft Portrait mode
– Sports Lesson mode

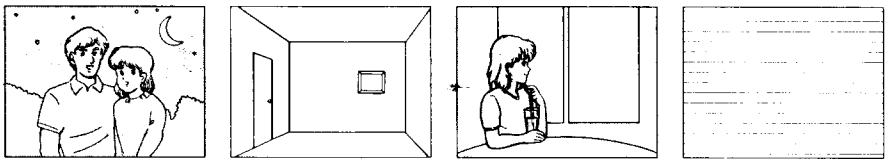
Note

When using the NightShot function, the PROGRAM AE indicator flashes to indicate that it will not operate with this function.

When to use manual focus

In the following cases you should obtain better results by adjusting the focus manually.

[a] **[b]** **[c]** **[d]**

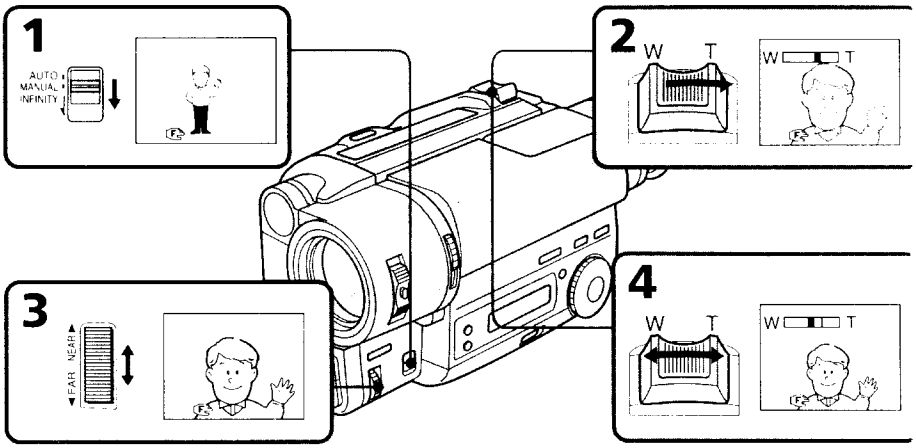


- Insufficient light **[a]**
- Subjects with little contrast - walls, sky, etc. **[b]**
- Too much brightness behind the subject **[c]**
- Horizontal stripes **[d]**
- Subjects through frosted glass
- Subjects beyond nets, etc.
- Bright subject or subject reflecting light
- Shooting a stationary subject when using a tripod

Focusing manually

When focusing manually, first focus in telephoto before recording, and then reset the shot length.

(1) Set FOCUS to MANUAL. The ☞ indicator appears in the viewfinder.
(2) Move the power zoom lever to the "T" side in the optical zoom zone until the lever reaches the end.
(3) Turn the NEAR/FAR dial to achieve a sharp focus.
(4) Set the desired shot length using the power zoom lever.



To return to autofocus mode

Set FOCUS to AUTO. The ☞ indicator in the viewfinder disappears.

Shooting in relatively dark places

Shoot at wide-angle after focusing in the telephoto position.

To record a very distant subject

Push FOCUS down to INFINITY. The lens focuses on the most distant subject while FOCUS is held down. When it is released, manual focus mode is resumed.
Use this function when shooting through a window or a screen, to focus on a most distant subject.

Note on manual focusing

The following indicators may appear:
▲ when recording a very distant subject.
▲ when the subject is too close to focus on.

Selecting picture effect

You can digitally process images to obtain special effects like those in films or on the TV.

[a] [b] [c] [d] [e] [f]

PASTEL [a]
The contrast of the picture is emphasized, and the picture looks like an animated cartoon.

NEG. ART [b]
The color and brightness of the picture is reversed.

SEPIA
The picture is sepia.

B&W
The picture is monochrome (black and white).

SOLARIZE [c]
The light intensity is more clear, and the picture looks like an illustration.

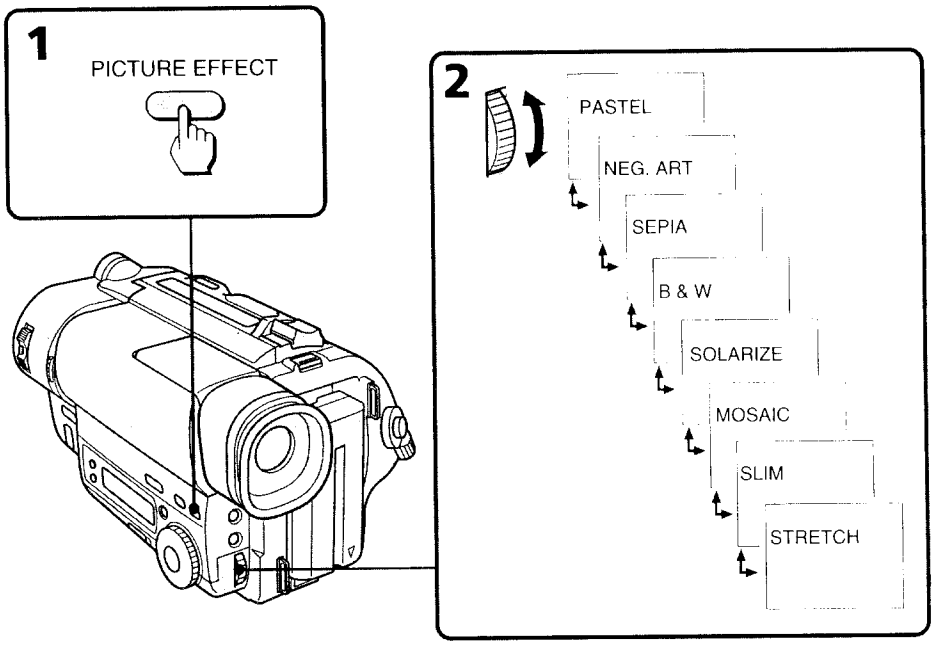
MOSAIC [d]
The picture is mosaic.

SLIM [e]
The picture expands vertically.

STRETCH [f]
The picture expands horizontally.

Using picture effect function

(1) Press PICTURE EFFECT.
(2) Turn the control dial to select the desired picture effect mode.



To turn off picture effect

Press PICTURE EFFECT. The indicator in the viewfinder goes out.

Note on the picture effect

When you turn the power off, the camcorder returns automatically to normal mode.

When to adjust the exposure

Adjust the exposure manually under the following cases.

[a]

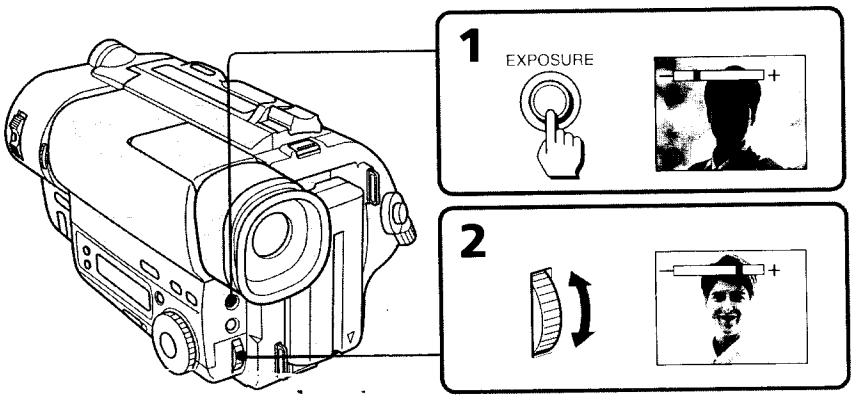
[b]

[a]
- The background is too bright (back lighting)
- Insufficient light: most of the picture is dark

[b]
- Bright subject and dark background
- To record the darkness faithfully

Adjusting the exposure

(1) Press EXPOSURE.
(2) Turn the control dial to adjust the brightness.



To return to automatic exposure mode

Press EXPOSURE again.

Shooting with the sun behind you

If the light source is behind your subject, or in the following situations, the subject will be recorded too dark.

- The subject is indoors and there is a window behind the subject.
- Bright light sources are included in the scene.
- When shooting a person wearing white or shiny clothes in front of a white background, the face will be recorded too dark.

Shooting in the dark

We recommend you to use the built-in light or a video light (not supplied). To get the best color, you must maintain a sufficient light level.

Note

You cannot adjust the exposure when using the NightShot function.

When you adjust the exposure manually

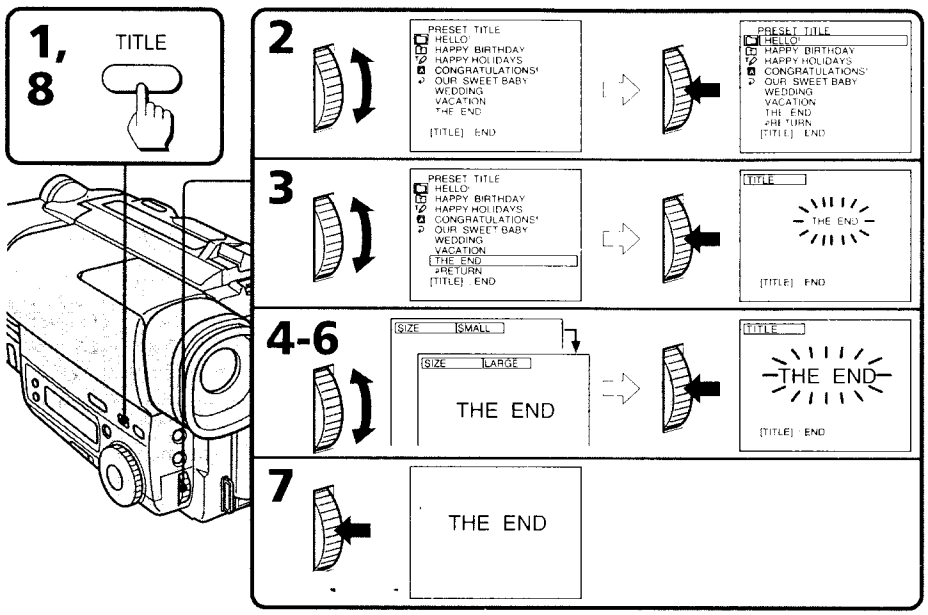
- BACK LIGHT does not work.
- If you change the setting of PROGRAM AE mode, the camcorder automatically returns to automatic exposure mode.

Superimposing a title

You can select one of eight preset titles and two custom titles. You can also select the language, color, size and position of titles.

Superimposing titles

(1) Press TITLE to display the title menu.
(2) Turn the control dial to select 🗀 , then press the dial.
(3) Turn the control dial to select the desired title, then press the dial. The titles are displayed in the language you selected.
(4) Turn the control dial to select the color, size, or position, then press the dial.
(5) Turn the control dial to select the desired item, then press the dial.
(6) Repeat step 4 and 5 until the title is arranged as desired.
(7) Press control dial again to complete the setting.
(8) When you want to stop recording the title, press TITLE.



To superimpose the title from beginning

After step 7, press START/STOP to start recording.

To superimpose the title while you are recording

After pressing START/STOP to start recording, start from step 1. In this case, beep is not heard.

To select the language of preset title

When you want to select the language, select A before step 2. Then select language and return to step 2.

To use the custom title

When you want to use the custom title, select T in step 2.

Notes on superimposing a title

- If you have not given any custom title, "- - - - ..." appears on the display.
- The FADER function works while the title is displayed, however, the title does not fade.
- If you display the menu or title menu while superimposing a title, the title is not recorded while the menu or title menu is being displayed.

Title color changes as follows :

WHITE ⟷ YELLOW ⟷ VIOLET ⟷ RED ⟷ CYAN ⟷ GREEN ⟷ BLUE

Title size changes as follows :

SMALL ⟷ LARGE

Title position changes as follows :

When you select the title size "SMALL", you can choose 9 positions. When you select the title size "LARGE" you can choose 8 positions.

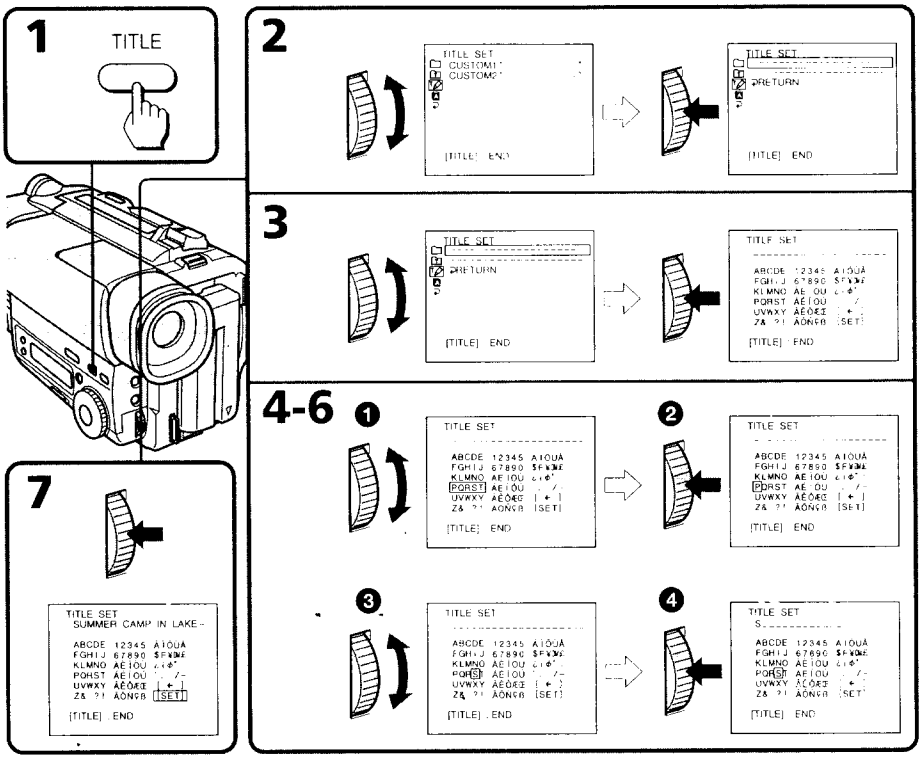
Notes on the title

- Depending on size or position of the title, both of date and time or either of them is not displayed.
- If you input 13 characters or more for a LARGE title, the title is automatically reduced into a proper size after the position is set.

Making your own titles

You can make up to two titles and store them in the camcorder. We recommend to set the POWER switch to PLAYER or eject the cassette before you begin.
Your title can have up to 20 characters.

(1) Press TITLE to display the title menu.
(2) Turn the control dial to select , then press the dial.
(3) Turn the control dial to select the first line (CUSTOM1) or second line (CUSTOM2), then press the dial.
(4) Turn the control dial to select the column of the desired character, then press the dial.
(5) Turn the control dial to select the desired character, then press the dial.
(6) Repeat step 4 and 5 until you finish the title.
(7) For finishing the titling work, turn the control dial to select SET, then press the dial.



To edit a title you have stored

In step 3, select CUSTOM1 or CUSTOM2, depending on which title you want to edit, then change the title.

Note

You can not enter over 20 characters title.

If you take 5 minutes or longer to enter characters while a cassette is in the camcorder

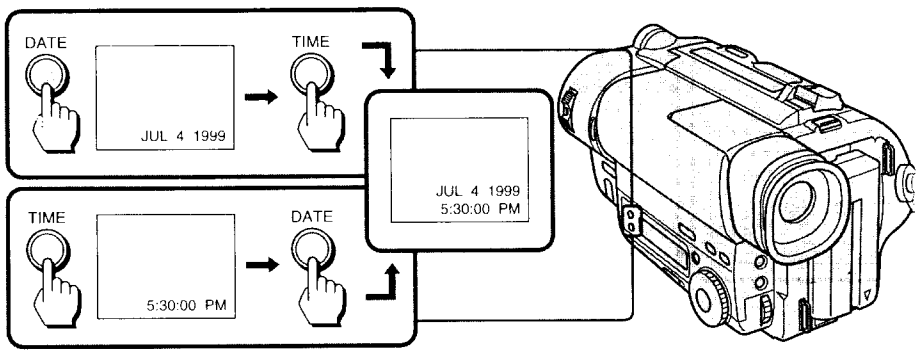
The power goes off automatically. Characters you have entered remain. Turn STANDBY down once and then up again, then proceed from step 1.

To delete a title

In step 4, turn the control dial to select [←] then press the dial. The last character is erased. Repeat this step until all characters are deleted.

Recording with the date/time

Before you start recording or during recording, press DATE or TIME. You can record the date or time displayed in the viewfinder with the picture. Press DATE (or TIME), then press TIME (or DATE) to display the date and time together.
The clock is set to East Coast Standard time at the factory. You can reset the clock in the menu system.



To stop recording with the date and/or time

Press DATE and/or TIME again. The date and/or time indicator disappears. The recording continues.

Optimizing the recording condition

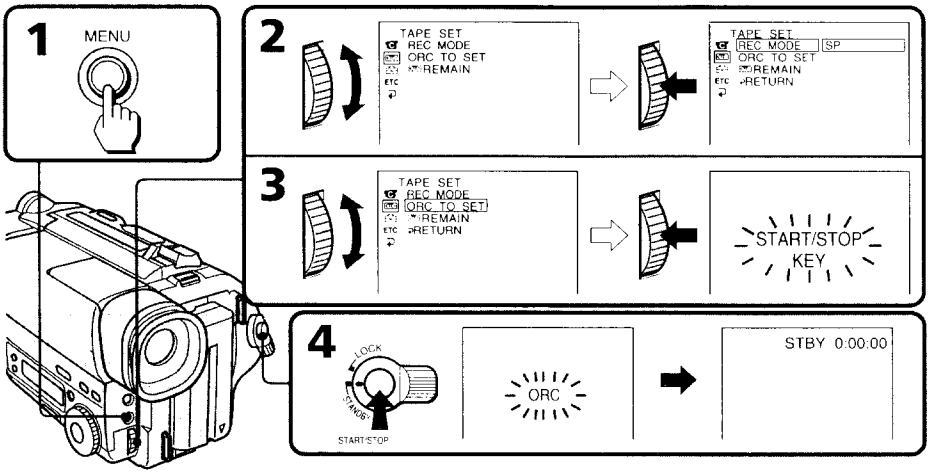
Use this feature to check the tape condition before recording, so that you can get the best possible picture (ORC).

(1) While the camcorder is in Standby mode, press MENU to display the menu.

(2) Turn the control dial to select [tape], then press the dial.

(3) Turn the control dial to select ORC TO SET, then press the dial.
"START/STOP KEY" flashes.

(4) Press START/STOP.
The camcorder takes about 5 - 10 seconds to check the tape condition and then returns to Standby mode.



Each time you insert the cassette

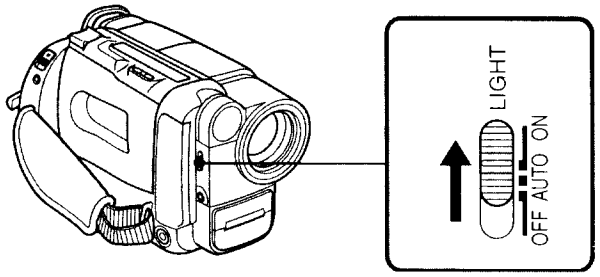
Perform the above procedures.

Notes on the ORC function

- When you set ORC TO SET, the recording on the tape is erased for about 0.1 second so that the camcorder can check the tape condition. Be careful when you use a recorded tape. The 0.1 second blank is erased if you record from the point where you set ORC TO SET for more than 2 seconds, or if you record over the blank.
- You cannot use this function on a tape with the red mark on the cassette exposed.
- ORC stands for "Optimizing the Recording Condition."

You can use the built-in light to suit your shooting situation. The recommended distance between the subject and camcorder is about 5 feet (1.5 m).

While the camcorder is in Standby mode, slide LIGHT to ON. The built-in light turns on.
The built-in light turns on/off by turning on/off STANDBY.



To stop using the built-in light

Slide LIGHT to OFF.

To turn on the built-in light automatically

Slide LIGHT to AUTO.
The built-in light automatically turns on and off according to the ambient brightness. However, if the built-in light turns on for more than about 5 minutes, it automatically turns off. In this case, turn STANDBY down once and turn it up again.

Notes

- The battery pack is quickly discharging while the built-in light is turned on. Slide LIGHT to OFF when not in use.
- When you do not use the camcorder, slide LIGHT to OFF and remove the battery pack to avoid turning on the built-in light accidentally.
- When flickering occurs when you shoot white and bright subjects in AUTO mode, slide LIGHT to ON.
- The built-in light may turn on/off when you use the PROGRAM AE or BACK LIGHT function.
- When inserting or ejecting a cassette, the built-in light may be turned off.

CAUTION

Be careful not to touch the lighting section, because the plastic window and surrounding surfaces are hot while the light is on. It remains hot for a while after the light is turned off.

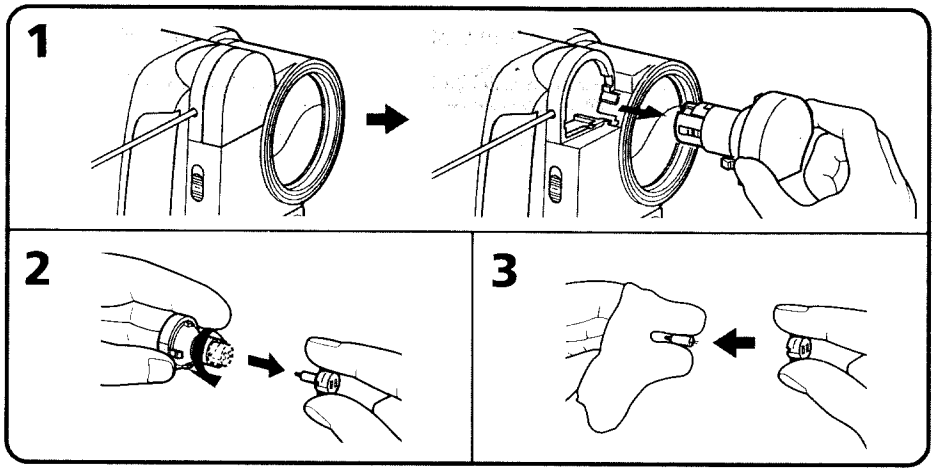
DANGER

Not to be handled by children.
Emits intense heat and light.
Use with caution to reduce the risk of fire or injury to persons.
Do not direct light at persons or materials from less than 4 feet (1.22 meters) during use and until cool.
Slide LIGHT to OFF when not in use.

Replacing the bulb

Use the Sony XB-3D halogen lamp (not supplied). The supplied halogen lamp is not on the market. Purchase the Sony XB-3D halogen lamp.
Remove the power source before replacing the bulb.

(1) While pushing the hole under the built-in light unit using a wire, remove the unit.
(2) Turn the bulb housing counterclockwise and detach from the built-in light unit.
(3) Replace the bulb using a dry cloth.
(4) Attach the bulb housing turning it clockwise, then replace the built-in light unit.



CAUTION

- When replacing the bulb, use only the Sony XB-3D halogen lamp (not supplied) to reduce the risk of fire.
- To prevent possible burn hazard, disconnect the power source before replacing and do not touch the bulb until the bulb becomes cool enough to handle (for about 30 minutes or more).

Note

To prevent the bulb from being smudged with finger prints, handle it with a dry cloth, etc. If the bulb is smudged, wipe it completely.

– CCD-TR716 only

When the SteadyShot function is working, the camcorder compensates for camera-shake.

You can release the SteadyShot function when you do not need to use the SteadyShot function. The indicator lights up when you release the SteadyShot function. You do not need to use the SteadyShot function when shooting a stationary object with a tripod. You can select ON or OFF in the menu system (p. 24).

To activate the SteadyShot function again

Set STEADYSHOT to ON in the menu system.

Notes on the SteadyShot function

- The SteadyShot function will not correct excessive camera-shake.
- When you set the STEADYSHOT function on or off in the menu system, the exposure may fluctuate.
- SteadyShot does not operate in 16:9 FULL mode. If you set STEADYSHOT to ON in the menu system, the indicator flashes.

Editing onto another tape

You can create your own video program by editing with any other 8 8 mm, Hi8 Hi8, mini DV mini DV, DV DV, VHS VHS, S-VHS S-VHS, VHSC VHSC, S-VHSC S-VHSC, β Betamax or ED Beta ED Betamax VCR that has video/audio inputs.

Before editing

Connect the camcorder to the VCR using the supplied A/V connecting cable.
Set the input selector on the VCR to LINE, if available.
Set EDIT to ON in the menu system (p. 26).

Starting editing

(1) Insert a blank tape (or a tape you want to record over) into the VCR, and insert your recorded tape into the camcorder.
(2) Play back the recorded tape on the camcorder until you locate the point just before where you want to start editing, then press II to set the camcorder in playback pause mode.
(3) On the VCR, locate the recording start point and set the VCR in recording pause mode.
(4) First press II on the camcorder, and after a few seconds press II of the VCR to start editing.

To edit more scenes

Repeat steps 2 to 4.

To superimpose the title while you are editing

You can superimpose the title while you are editing. Refer to "Superimpose a title" (p. 41).

To stop editing

Press ■ on both the camcorder and the VCR.

Note on the DISPLAY function

If you have displayed the viewfinder screen indicators on the TV, erase the indicators by pressing DISPLAY on the Remote Commander so that they will not be superimposed on the edited tape.

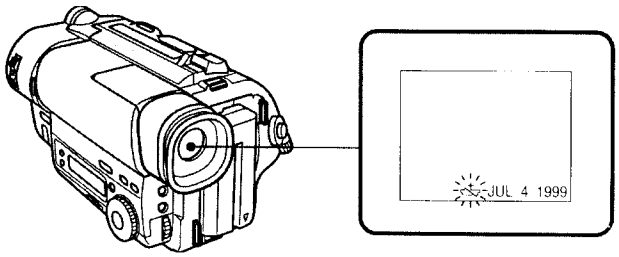
Note on Fine Synchro Edit

If you connect a video deck that has the Fine Synchro Edit feature to the LANC jack of the camcorder, using a LANC cable (not supplied), the edit will be even more precise.

Changing the lithium battery in the camcorder

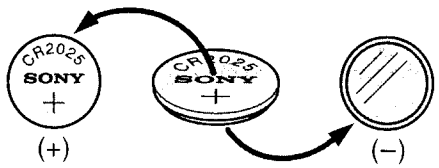
Your camcorder is supplied with a lithium battery installed. When the battery becomes weak or dead, the ⚠ indicator flashes in the viewfinder for about 5 seconds when you set the POWER switch to CAMERA. In this case, **replace the battery with a Sony CR2025 or Duracell DL-2025 lithium battery. Use of any other battery may present a risk of fire or explosion.** Discard used batteries according to the manufacturer's instructions.

The lithium battery for the camcorder lasts for about 1 year under normal operation. (The lithium battery that comes installed at the factory may not last 1 year.)



Notes on lithium battery

- **Keep the lithium battery out of the reach of children. Should the battery be swallowed, immediately consult a doctor.**
- Wipe the battery with a dry cloth to assure a good contact.
- Do not hold the battery with metallic tweezers, otherwise a short-circuit may occur.
- Note that the lithium battery has a positive (+) and a negative (–) terminals as illustrated. **Be sure to install the lithium battery so that terminals on the battery match the terminals on the camcorder.**



WARNING

The battery may explode if mistreated. Do not recharge, disassemble, or dispose of in fire.

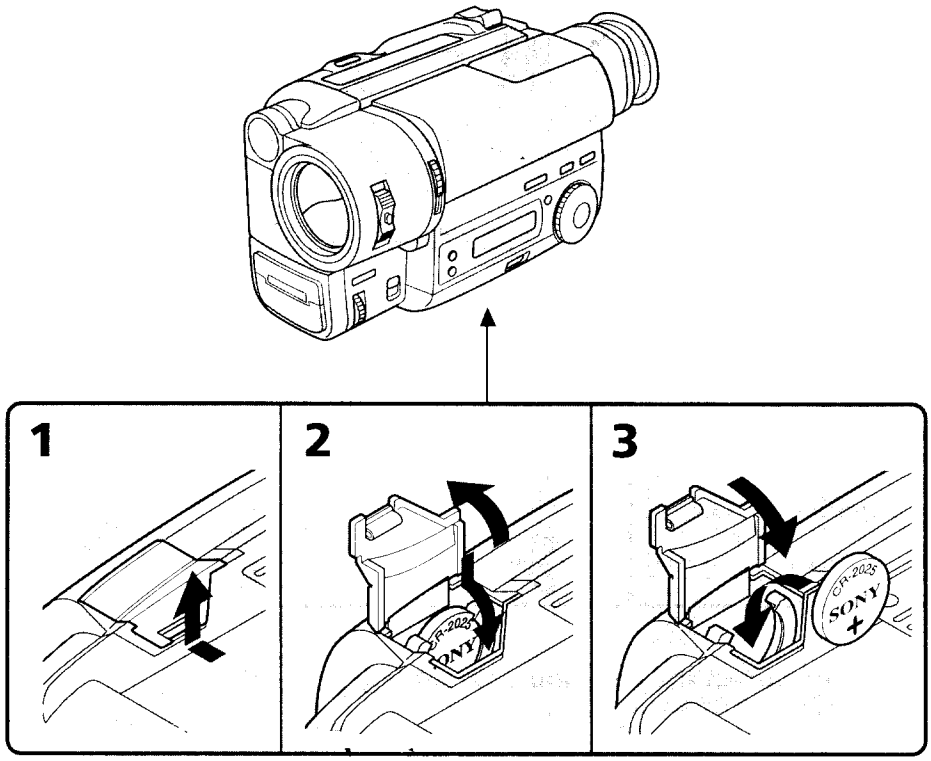
Changing the lithium battery

When replacing the lithium battery, keep the battery pack or other power source attached. Otherwise, you will need to reset the date, time and other items in the menu system retained by the lithium battery.

(1) Open the lid of the lithium battery compartment.

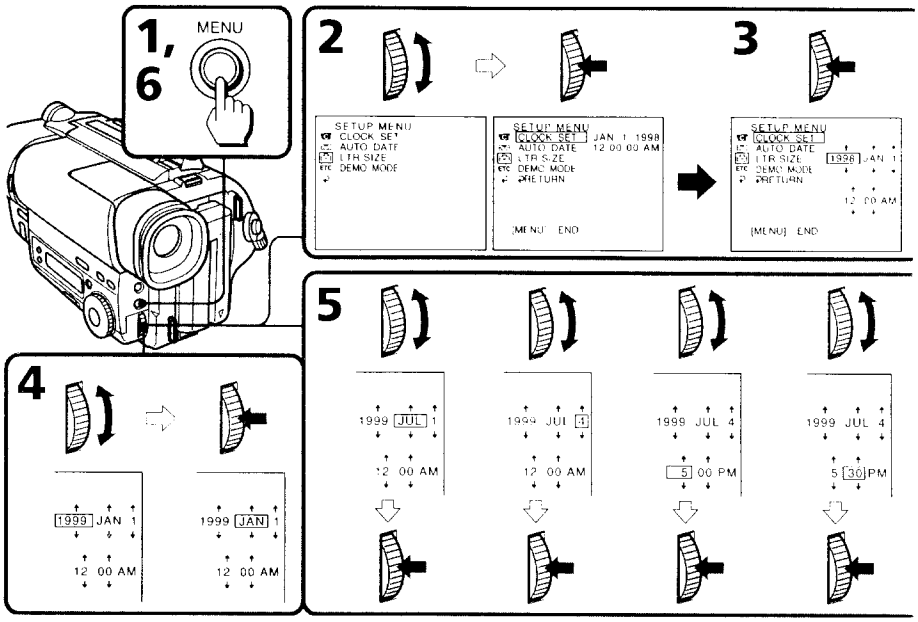
(2) Push the lithium battery down once and pull it out from the holder.

(3) Install the lithium battery with the positive (+) side facing out. Close the lid.



You can reset the date and time in the menu system.

(1) While the camcorder is in Standby mode, press MENU to display the menu.
(2) Turn the control dial to select ☎, then press the dial.
(3) Turn the control dial to select CLOCK SET, then press the dial.
(4) Turn the control dial to adjust the desired year, then press the dial.
(5) Set the month, day, hour and minute by turning the control dial and pressing the dial.
(6) Press MENU to erase the menu display.



To correct the date and time setting

Repeat the above procedure.

To check the preset date and time

Press DATE to display the date indicator.
Press TIME to display the time indicator.
When you press the same button again, the indicator goes off.

The year changes as follows:

1998 ⟷ 1999 ← · · · · → 2029

Note on the time indicator

The internal clock of this camcorder operates on a 12-hour cycle.
- 12:00 AM stands for midnight.
- 12:00 PM stands for noon.

Simple setting of clock by time difference

You can easily set the clock for a local time by a time difference in the menu system.

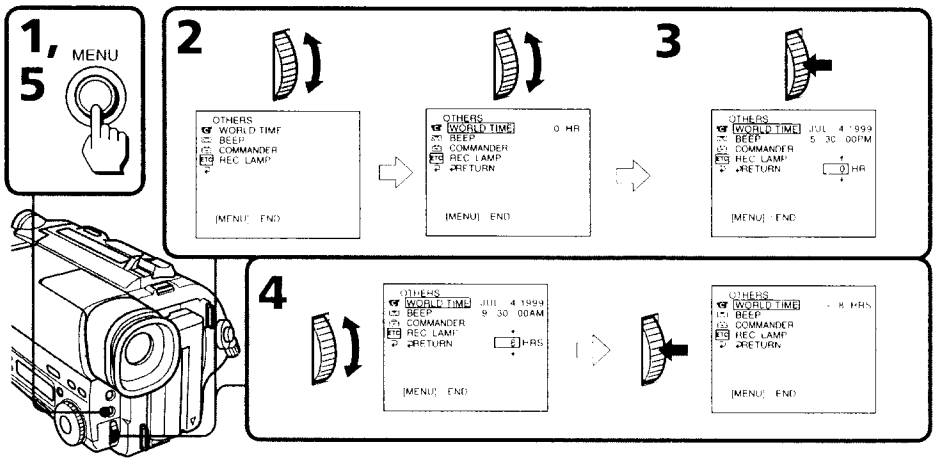
(1) While the camcorder is in the standby mode, press MENU to display the menu.

(2) Turn the control dial to select **ETC**, then press the dial.

(3) Turn the control dial to select WORLD TIME, then press the dial.

(4) Turn the control dial to set a time difference, and press the dial. The hour of clock changes in relation to a time difference which you set.

(5) Press MENU to erase the menu display.



Note on WORLD TIME

If the time is not set, WORLD TIME does not work.

Selecting cassette types

This Hi8 system is an extension of the standard 8 mm system, and was developed to realize higher picture quality.
You can use either Hi8 or standard 8 mm video cassette for this camera. When you use a Hi8 video cassette, the recording is made in the Hi8 system. When you use a standard 8 mm video cassette, the recording is made in the standard 8 mm system. Standard 8 mm video cassette is incapable of recording in the Hi8 system.
If you intend to use a standard 8 mm video recorder/player to play back a video tape, you are required to use a standard 8 mm video cassette for recording.

When you play back

The playback mode (SP/LP) and system (Hi8/standard 8 mm) are selected automatically according to the format in which the tape has been recorded. The quality of the recorded picture in LP mode, however, will not be as good as that in SP mode.

Foreign 8 mm video

Because the TV color systems differ from country to country, you may not be able to play back foreign pre-recorded tapes. Refer to the list of "Using your camcorder abroad" to check the TV color system of foreign countries.

Tips for using the battery pack

This section shows you how you can get the most out of your battery pack.

Preparing the battery pack

Always carry additional batteries

Have sufficient battery pack power to do 2 to 3 times as much recording as you have planned.

Battery life is shorter in a cold environment

Battery efficiency is decreased, and the battery will be used up more quickly, if you are recording in a cold environment.

To save battery power

Turn STANDBY down when not recording to save battery power.
A smooth transition between scenes can be made even if recording is stopped and started again. While you are positioning the subject, selecting an angle, or looking through the viewfinder lens, the lens moves automatically and the battery is used. The battery is also used when a tape is inserted or removed.
Be sure and remove the battery pack after using the camcorder.

When to replace the battery pack

While you are using your camcorder, the remaining battery indicator decreases gradually as battery power is used up. Remaining time in minutes appears.

When the remaining battery indicator reaches the lowest point, the indicator may appear and start flashing in the viewfinder.
When the indicator changes from slow flashing to rapid flashing while you are recording, set the POWER switch to OFF on the camcorder and replace the battery pack. Leave the tape in the camcorder to obtain a smooth transition between scenes after the battery pack has been replaced.

Notes on the rechargeable battery pack

Caution

Never leave the battery pack in temperatures above 140°F (60°C), such as in a car parked in the sun or under direct sunlight.

The battery pack heats up

During charging or recording, the battery pack heats up. This is caused by energy that has been generated and a chemical change that has occurred inside the battery pack. This is not cause for concern and is normal.

Be sure to observe the following

- Keep the battery pack away from fire.
- Keep the battery pack dry.
- Do not open nor try to disassemble the battery pack.
- Do not expose the battery pack to any mechanical shock.

The life of the battery pack

If the battery indicator flashes rapidly just after turning on the camcorder with a fully charged battery pack, the battery pack should be replaced with a new fully charged one.

Charging temperature

You should charge batteries at temperatures from 50°F to 86°F (from 10°C to 30°C). Lower temperatures require a longer charging time.

Notes on the "InfoLITHIUM" battery pack

What is "InfoLITHIUM"

The "InfoLITHIUM" is a lithium ion battery pack which can exchange data with compatible video equipment about its battery consumption.
When you use this battery pack with video equipment having the InfoLITHIUM mark, the video equipment will indicate the remaining battery time in minutes*. However, if you use it with video equipment not having this mark, the remaining battery capacity will not be indicated in minutes.
"InfoLITHIUM" is a trademark of Sony Corporation.
* The indication may not be accurate depending on the condition and environment which the equipment is used under.

How the battery consumption is displayed

The power consumption of the camcorder changes depending on its use, such as how the autofocusing is working.
While checking the condition of the camcorder, the "InfoLITHIUM" battery pack measures the battery consumption and calculates the remaining battery power. If the condition changed drastically, the remaining battery indication may suddenly decrease or increase by more than 2 minutes.
Even if 5 to 10 minutes is indicated as the battery remaining time in the viewfinder, the ⌧ indicator may also flash under some condition.

To obtain more accurate remaining battery indication

Set the camcorder to recording standby mode and point towards a stationary object. Do not move the camcorder for 30 seconds or more.
- If the indication seems incorrect, recharge the battery pack fully (Full charge[1]). Note that if you have used the battery in a hot or cold environment for long time, or you have repeated charging many times, the battery pack may not be able to show the correct time even after being fully charged.
- After you have used the "InfoLITHIUM" battery pack with an equipment not having the InfoLITHIUM mark, make sure that you use up the battery pack on the equipment having the InfoLITHIUM mark and then recharge fully.

Why the remaining battery indication does not match the continuous recording time in the operating instructions

The recording time is affected by the environmental temperature and conditions. The recording time becomes very short in a cold environment. The continuous recording time in the operating instructions is measured under the condition of using a fully charged (or normal charged) battery pack in 77°F (25°C). As the environmental temperature and condition are different when you actually use the camcorder, the remaining battery time is not same as the continuous recording time in the operating instructions.

[1] Full charge: Charging until FULL appears in the display window.

Moisture condensation

If the camcorder is brought directly from a cold place to a warm place, moisture may condense inside the camcorder, on the surface of the tape, or on the lens. In this condition, the tape may stick to the head drum and be damaged or the unit may not operate correctly. To prevent possible damage under these circumstances, the camcorder is furnished with moisture sensors. Please take the following precautions.

Inside the camcorder

If there is moisture inside the camcorder, the beep sounds and the 💧 indicator flashes. If this happens, none of the functions except cassette ejection will work. Open the cassette compartment, turn off the camcorder, and leave it about 1 hour. When ⏏ indicator flashes at the same time, the cassette is inserted in the camcorder. Eject the cassette, turn off the camcorder, and leave also the cassette about 1 hour. The camcorder can be used again if the 💧 indicator does not appear when the power is turned on again.

On the lens

If moisture condenses on the lens, no indicator appears, but the picture becomes dim. Turn off the power and do not use the camcorder for about 1 hour.

How to prevent moisture condensation

When bringing the camcorder from a cold place to a warm place, put the camcorder in plastic bag and allow it to adapt to room conditions over a period of time.

(1) Be sure to tightly seal the plastic bag containing the camcorder.

(2) Remove the bag when the air temperature inside it has reached the temperature surrounding it (after about 1 hour).

Video head cleaning

To ensure normal recording and clear pictures, clean the video heads. When the ⊗ indicator and "CLEANING CASSETTE" message appear one after another or playback pictures are "noisy" or hardly visible, the video heads may be dirty.

[a] Slightly dirty
[b] Very dirty

If this happens, clean the video heads with the Sony V8-25CLD/V8-25CLDR cleaning cassette (not supplied). After checking the picture, if it is still "noisy," repeat the cleaning. (Do not repeat cleaning more than 5 times in one session.)

Caution

Do not use a commercially available wet-type cleaning cassette. It may damage the video heads.

Note

If the Sony V8-25CLD/V8-25CLDR cleaning cassette is not available in your area, consult your nearest Sony dealer.

Precautions

Camcorder operation

- Operate the camcorder on 7.2 V (battery pack) or 8.4 V (AC power adaptor).
- For DC or AC operation, use the accessories recommended in this manual.
- Should any solid object or liquid get inside the casing, unplug the camcorder and have it checked by a Sony dealer before operating it any further.
- Avoid rough handling or mechanical shock. Be particularly careful of the lens.
- Keep the POWER switch setting to OFF when not using the camcorder.
- Do not wrap up the camcorder and operate it since heat may build up internally.
- Keep the camcorder away from strong magnetic fields or mechanical vibration.

Built-in light

- Do not knock or jolt the built-in light while it is turned on as it may damage the bulb or shorten the life of the bulb.
- Do not leave the built-in light on while it is resting on or against something; it may cause a fire or damage the built-in light.

On handling tapes

Do not insert anything in the small holes on the rear of the cassette. These holes are used to sense the type of tape, thickness of tape and if the recording tab is in or out.

Camcorder care

- When the camcorder is not to be used for a long time, remove the tape. Periodically operate the camcorder both in CAMERA and PLAYER modes and play back a tape for about 3 minutes.
- Clean the lens with a soft brush to remove dust. If there are fingerprints on it, remove them with a soft cloth.
- Clean the camcorder body with a dry soft cloth, or a soft cloth lightly moistened with a mild detergent solution. Do not use any type of solvent which may damage the finish.
- Do not let sand get into the camcorder. When you use the camcorder on a sandy beach or in a dusty place, protect it from the sand or dust with some protector such as Sony sports pack. Sand or dust may cause the unit to malfunction, and sometimes this malfunction cannot be repaired.

AC power adaptor

- Unplug the unit from the wall outlet when not in use for a long time. To disconnect the power cord, pull it out by the plug. Never pull the power cord itself.
- Do not operate the unit with a damaged cord or if the unit has been dropped or damaged.
- Do not bend the power cord forcibly, or put a heavy object on it. This will damage the cord and may cause a fire or electrical shock.
- Be sure that nothing metallic comes into contact with the metal parts of the connecting plate. If this happens, a short may occur and the unit may be damaged.
- Always keep the metal contacts clean.
- Do not disassemble the unit.
- Do not apply mechanical shock or drop the unit.
- While the unit is in use, particularly during charging, keep it away from AM receivers and video equipment because it will disturb AM reception and video operation.
- The unit becomes warm while in use. This is normal.
- Do not place the unit in locations that are:
  - Extremely hot or cold
  - Dusty or dirty
  - Very humid
  - Vibrating

Notes on dry batteries

To avoid possible damage from battery leakage or corrosion, observe the following.

- Be sure to insert the batteries in the correct direction.
- Dry batteries are not rechargeable.
- Do not use a combination of new and old batteries.
- Do not use different types of batteries.
- The batteries slowly discharge while not in use.
- Do not use a battery that is leaking.

If battery leakage occurred

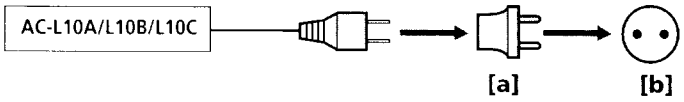
- Wipe off the liquid in the Remote Commander carefully before replacing the batteries.
- If you touch the liquid, wash it off with water.
- If the liquid get into your eyes, wash your eyes with a lot of water and then consult a doctor.

If any difficulty should arise, unplug the unit and contact your nearest Sony dealer.

Each country or area has its own electric and TV color systems. Before using your camcorder abroad, check the following points.

Power sources

You can use your camcorder in any country or area with the supplied AC power adaptor within 100 V to 240 V AC, 50/60 Hz.
Use a commercially available AC plug adaptor **[a]**, if necessary, depending on the design of the wall outlet **[b]**.



Difference in color systems

This camcorder is an NTSC system based camcorder. If you want to view the playback picture on a TV, it must be an NTSC system based TV.
Check the following list.

NTSC system
Bahama Islands, Bolivia, Canada, Central America, Chile, Colombia, Ecuador, Jamaica, Japan, Korea, Mexico, Peru, Surinam, Taiwan, the Philippines, the U.S.A., Venezuela, etc.

PAL system
Australia, Austria, Belgium, China, Czech Republic, Denmark, Finland, Germany, Grea Britain, Holland, Hong Kong, Italy, Kuwait, Malaysia, New Zealand, Norway, Portugal Singapore, Slovak Republic, Spain, Sweden, Switzerland, Thailand, etc.

PAL-M system
Brazil

PAL-N system
Argentina, Paraguay, Uruguay

SECAM system
Bulgaria, France, Guyana, Hungary, Iran, Iraq, Monaco, Poland, Russia, Ukraine, etc.

If you run into any problem using the camcorder, use the following table to troubleshoot the problem. Should the difficulty persist, disconnect the power source and contact your Sony dealer or local authorized Sony service facility.

Camcorder

Power

Symptom	Cause and/or Corrective Actions
The power is not on.	• The battery pack is not installed. → Install the battery pack. (p. 6) • The battery is dead. → Use a charged battery pack. (p. 7) • The AC power adaptor is not connected to a wall outlet. → Connect the AC power adaptor to a wall outlet. (p. 21)
The power goes off.	• While being operated in CAMERA mode, the camcorder has been in Standby mode for more than 5 minutes. → Turn STANDBY down once and then up again. (p. 12) • The battery is dead. → Use a charged battery pack. (p. 7)
The battery pack is quickly discharged.	• The camcorder does not operate when using a battery pack that is not an "InfoLITHIUM" battery pack. → Use an "InfoLITHIUM" battery pack. (p. 57) • The ambient temperature is too low. (p. 56) • The battery pack has not been charged fully. → Charge the battery pack again. (p. 7) • The battery pack is completely dead, and cannot be recharged. → Use another battery pack. (p. 56)
While charging the battery pack, no indicator appears or the indicator flashes in the display window.	• The AC power adaptor is disconnected. → Connect it firmly. • Something is wrong with the battery pack. → Contact your Sony dealer or local authorized Sony service facility.
START/STOP does not operate.	• The tape is stuck to the drum. → Eject the tape. (p. 10) • The tape has run out. → Rewind the tape or use a new one. (p. 10, 19) • The POWER switch is set to PLAYER. → Set it to CAMERA. (p. 11) • The tab on the cassette is out (red). → Use a new tape or slide the tab. (p. 10)
Recording stops in a few seconds.	• The START/STOP MODE switch is set to 5SEC or ANTI GROUND SHOOTING ⏚. → Set it to ⏚. (p. 15)

(to be continued)

Operation

Symptom	Cause and/or Corrective Actions
The cassette cannot be removed from the holder.	• The battery is dead. → Use a charged battery pack or the AC power adaptor. (p. 7, 21)
⏬ and ⏏ indicators flash and no function except for cassette ejection works.	• Moisture condensation has occurred. → Remove the cassette and leave the camcorder for at least 1 hour. (p. 58)
The date or time indicator is flashing.	• You pressed DATE and TIME together for more than 2 seconds. → The camcorder is not malfunctioning. You may start recording. Flashing will stop soon. • The lithium battery is weak or dead. → Replace the lithium battery with a new one. (p. 51)
The tape does not move when a video control button is pressed.	• The POWER switch is set to CAMERA or OFF. → Set it to PLAYER. • The tape has run out. → Rewind the tape or use a new one. (p. 19)
The Steadyshot function does not activate. (CCD-TR716 only)	• STEADYSHOT is set to OFF in the menu system. → Set it to ON. (p. 48) • The Steadyshot function does not work when the wide mode is set to 16:9 FULL.
The autofocusing function does not work.	• FOCUS is set to MANUAL. → Set it to AUTO. (p. 36) • Shooting conditions are not suitable for autofocus. → Set FOCUS to MANUAL to focus manually. (p. 36)
The fader function does not work.	• The START/STOP MODE switch is set to 5SEC or ANTI GROUND SHOOTING ⏚. → Set it to ⏚. (p. 15)
The date or time indicator disappears.	• Reset the date and time. (p. 52)
Exposure adjustment or the PROGRAM AE function does not work.	• The NIGHTSHOT switch is set to ON. → Set it to OFF.
The image on the viewfinder screen is not clear.	• The viewfinder lens is not adjusted. → Adjust the viewfinder lens. (p. 12)
A vertical band appears when a subject such as lights or a candle flame is shot against a dark background.	• The contrast between the subject and background is too high. The camcorder is not malfunctioning. → Change locations.
A vertical band appears when shooting a very bright subject.	• The camcorder is not malfunctioning.

Picture

Symptom	Cause and/or Corrective Actions
The playback picture is not clear.	• EDIT is set to ON in the menu system. → Set it to OFF. (p. 26)
The picture is "noisy".	• The video heads may be dirty. → Clean the heads using the Sony V8-25CLD/V8-25CLDR cleaning cassette (not supplied). (p. 59)
An unknown picture is displayed in the viewfinder.	• If 10 minutes elapse after you set the POWER switch to CAMERA without inserting a cassette, the camcorder automatically starts the demonstration or DEMO is set ON in the menu system. → Insert the cassette and the demonstration stops. You can deactivate the demonstration. (p. 25)
The five digit code appears.	• The self-diagnosis function is activated. → Check the code and solve the problem. (p. 66)
Picture is recorded in incorrect/ unnatural color.	• The NIGHTSHOT switch is set to ON. → Set it to OFF. (p. 30)
Picture appears too bright, and the subject does not appear in the viewfinder.	• The NIGHTSHOT switch is set to ON in a bright place. → Set it to OFF, or use the NightShot function in a dark place. (p.30)

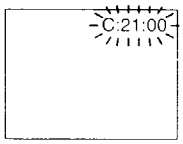
Others

Symptom	Cause and/or Corrective Actions
The supplied Remote Commander does not work.	• COMMANDER is set to OFF in the menu system. → Set it to ON. (p. 24) • Something is blocking the infrared rays. → Remove the obstacle. • The batteries are not inserted with the correct polarity. → Insert the batteries with the correct polarity. (p. 72) • The batteries are dead. → Insert new ones. (p. 72)
The beep sounds for 5 seconds.	• Moisture condensation has occurred. → Remove the cassette and leave the camcorder for at least 1 hour. (p. 58) • Some troubles occur in your camcorder. → Remove the cassette and insert it again, then operate the camcorder.

Self-diagnosis display

The camcorder has a self-diagnosis display. This function displays the camcorder's condition with five digits (a combination of a letter and figures) in the viewfinder or in the display window. If this occurs, check the following code chart. The five-digit display informs you of the camcorder's current condition. The last two digits (indicated by □□) will differ depending on the state of the camcorder.

Viewfinder



Self-diagnosis display

- C:□□:□□
  You can service the camcorder yourself.
- E:□□:□□
  Contact your Sony dealer or local authorized Sony facility.

Five-digit display	Cause and/or Corrective Actions
C:21:□□	• Moisture condensation has occurred. → Remove the cassette and leave the camcorder for at least 1 hour. (p. 58)
C:22:□□	• The video heads are dirty. → Clean the heads using the Sony V8-25CLD/V8-25CLDR cleaning cassette (not supplied). (p. 59)
C:23:□□	• You are using a battery pack that is not an "InfoLITHIUM" battery pack. → Use an "InfoLITHIUM" battery pack. (p. 57)
C:31:□□ C:32:□□	• A serviceable situation not mentioned above has occurred. → Remove the cassette and insert it again, then operate the camcorder. → Disconnect the power cord of the AC power adaptor or remove the battery pack. After reconnecting the power source, operate the camcorder.
E:61:□□ E:62:□□	• A camcorder malfunction which you cannot service has occurred. → Contact your Sony dealer or local authorized Sony service facility and inform them of the five digits. (example: E:61:10)

If you are unable to resolve the problem, contact your Sony dealer or local authorized Sony service facility.

Video camera recorder

System

Video recording system
2 rotary heads
Helical scanning FM system

Audio recording system
Rotary heads, FM system

Video signal
NTSC color, EIA standards

Usable cassette
8mm video format cassette
Hi8 or standard 8

Recording / Playback time (using 120 min. cassette)
SP mode: 2 hours
LP mode: 4 hours

Fastforward/rewind time (using 120 min. cassette)
Approx. 5 min.

Image device
1/4 CCD (Charge Coupled Device)
CCD-TR516: Approx. 270,000 pixels (Effective: approx. 250,000 pixels)
CCD-TR716: Approx. 320,000 pixels (Effective: approx. 200,000 pixels)

Viewfinder
Electronic viewfinder (color)

Lens
Combined power zoom lens
Filter diameter 1 7/16 in. (37 mm)
18 × (Optical), 330 × (Digital)

Focal distance
3/16 - 8 in. (4.1 - 73.8 mm)
When converted to a 35 mm still camera
CCD-TR516: 1 9/16 - 28 in. (39.4 - 709 mm)
CCD-TR716: 1 7/8 - 33 1/2 in. (47.2 - 850 mm)

Color temperature
Auto

Minimum illumination
0.4 lux at F 1.4
0 lux (in NightShot mode)*

Illumination range
0.4 lux to 100,000 lux

Recommended illumination
More than 100 lux

* Object invisible for the dark can be shot with infrared lighting.

Input and output connectors

Video output
Phono jack, 1 Vp-p, 75 ohms, unbalanced

Audio output
Monaural, Phone jack,
327 mV (at output impedance 47 kilohms) impedance less than 2.2 kilohms

RFU DC OUT
Special minijack, DC 5V

LANC control jack
Stereo mini-minijack (ø 2.5 mm)

MIC jack
Minijack, 0.388 mV low impedance with 2.5 to 3.0 V DC, output impedance 6.8 kilohms (ø 3.5 mm)
Monaural type

General

Power requirements
7.2 V (battery pack)
8.4 V (AC power adaptor)

Average power consumption (when using the battery pack)
During camera recording
CCD-TR516: 2.4 W
CCD-TR716: 2.5 W

Operating temperature
32°F to 104°F (0°C to 40°C)

Storage temperature
–4°F to +140°F (–20°C to +60°C)

Dimensions (Approx.)
4 1/4 × 4 1/4 × 7 5/8 in.
(107 x 107 x 193 mm) (w/h/d)

Mass (Approx.)
CCD-TR516: 1 lb 11 oz (780 g)
CCD-TR716: 1 lb 11 oz (790 g)
excluding the battery pack, lithium battery, cassette and shoulder strap
CCD-TR516: 2 lb (920 g)
CCD-TR716: 2 lb (930 g)
including the battery pack NP-F330, lithium battery CR2025, cassette and shoulder strap

Microphone
Monaural type

Supplied accessories
See page 5.

AC power adaptor

Power requirements
100 - 240 V AC, 50/60 Hz

Power consumption
23 W

Output voltage
DC OUT: 8.4 V, 1.5 A in operating mode

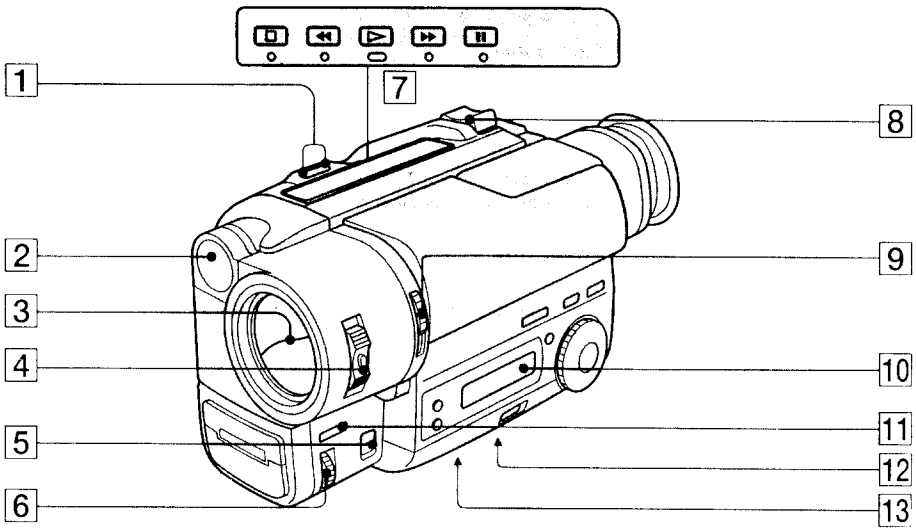
Operating temperature
32°F to 104°F (0°C to 40°C)

Storage temperature
–4°F to +140°F (–20°C to +60°C)

Dimensions (Approx.)
5 × 1 9/16 × 2 1/2 in. (125 × 39 × 62 mm) (w/h/d) excluding projecting parts

Mass (Approx.)
9.8 oz (280 g)
excluding power cord

Design and specifications are subject to change without notice.



1 **EDITSEARCH button** (p. 17)

2 **Built-in light** (p. 46)

3 **Lens cover**

4 **POWER switch** (p. 11)

5 **FOCUS switch** (p. 36)

6 **NEAR/FAR dial** (p. 36)

7 **Video control buttons** (p. 19)
- ■ STOP (stop)
- ◄◄ REW (rewind)
- ► PLAY (playback)
- ►► FF (fastforward)
- ❚❚ PAUSE (pause)

8 **Power zoom lever** (p. 14)

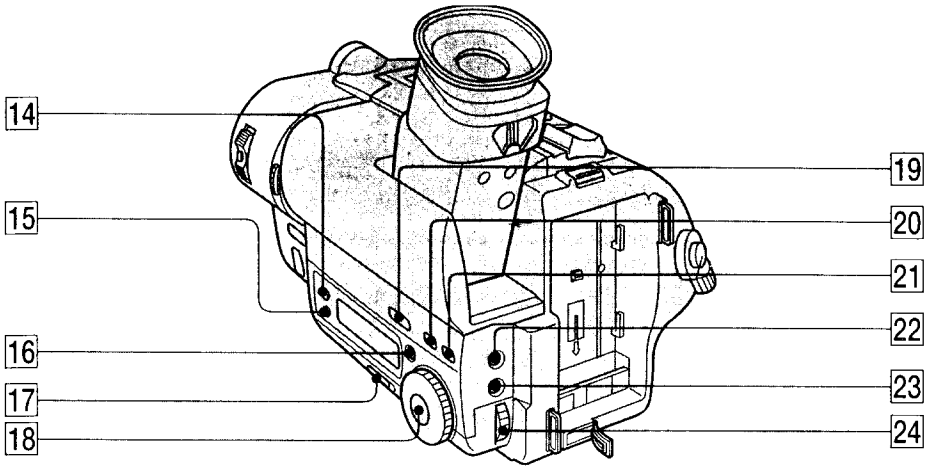
9 **NIGHTSHOT switch** (p. 30)

10 **Display window** (p. 74)

11 **FADER button** (p. 29)

12 **Tripod receptacle** (p. 16)
Make sure that the length of the tripod screw is less than 9/32 inch (6.5 mm) otherwise, you cannot attach the tripod securely and the screw may damage the camcorder.

13 **Lithium battery compartment** (p. 51)



14 **DATE button** (p. 44)

15 **TIME button** (p. 44)

16 **COUNTER RESET button** (p. 13)

17 **START/STOP MODE switch** (p. 15)

18 **PROGRAM AE dial** (p. 34)

19 **BACK LIGHT button** (p. 27)

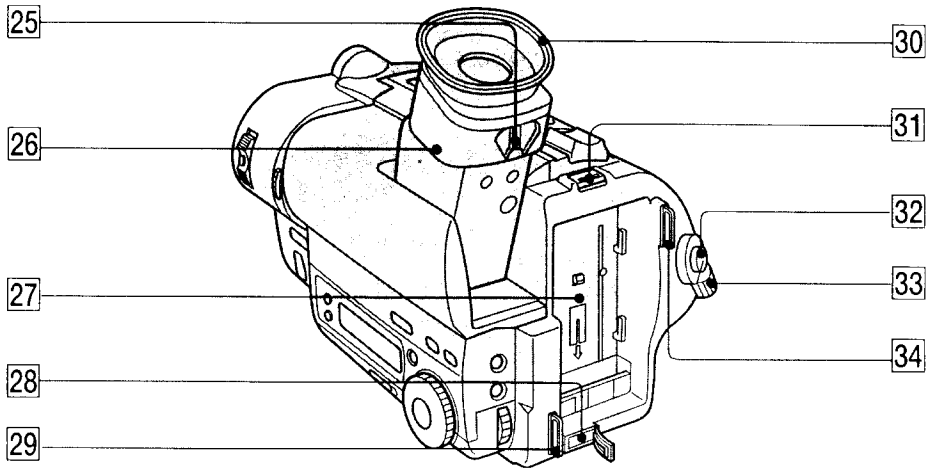
20 **TITLE button** (p. 41)

21 **PICTURE EFFECT button** (p. 38)

22 **EXPOSURE button** (p. 39)

23 **MENU button** (p. 23)

24 **Control dial** (p. 23)



25 **Viewfinder lens adjustment lever** (p. 12)

26 **Viewfinder** (p. 12)

27 **Battery mounting surface**

28 **DC IN jack** (p. 7, 21)

29 **Hook for shoulder strap** (p. 73)

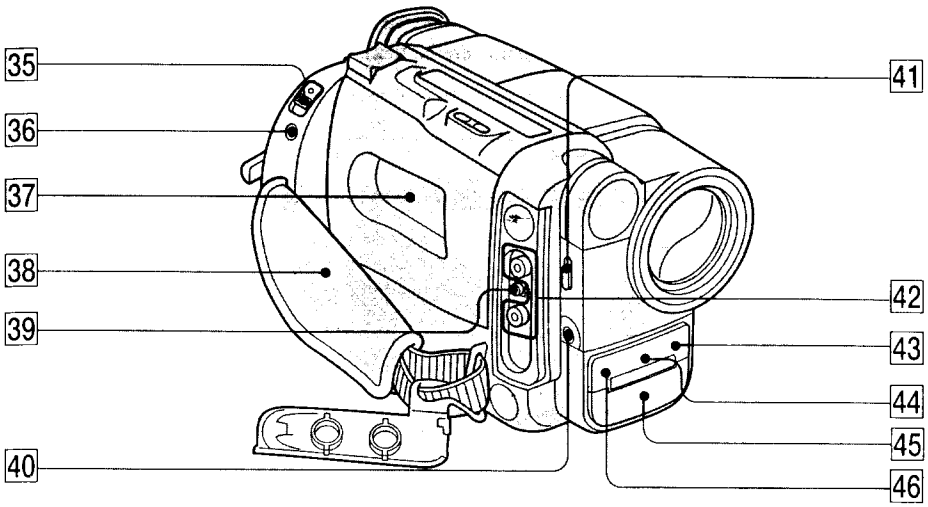
30 **Eyecup**

31 **BATT RELEASE lever** (p. 9)

32 **START/STOP button** (p. 11)

33 **STANDBY switch** (p. 11)

34 **Hook for shoulder strap** (p. 73)



35 **EJECT switch** (p. 10)

36 **LANC control jack**
stands for Local Application Control Bus System. The control jack is used for controlling the tape transport of video equipment and peripherals connected to it. This jack has the same function as the jack indicated as CONTROL L or REMOTE.

37 **Cassette compartment** (p. 10)

38 **Grip strap** (p. 16)

39 **RFU DC OUT (RFU adaptor DC output) jack** (p. 18)

40 **MIC jack (PLUG IN POWER)**
Connect an external microphone (not supplied). This jack also accepts a "plug-in-power" microphone.

41 **LIGHT switch** (p. 46)

42 **VIDEO/AUDIO jacks** (p. 18)

43 **Remote sensor** (p. 72)
Aim the Remote Commander here for remote control.

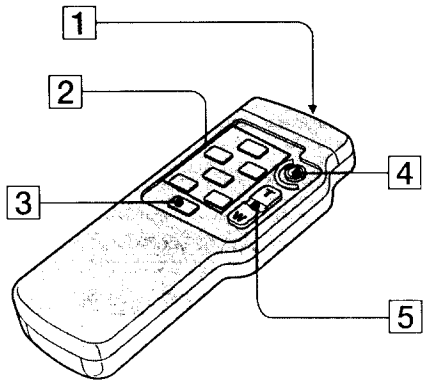
44 **NightShot light emitter** (p. 30)

45 **Microphone**

46 **Camera recording/battery lamp** (p. 11)

Remote Commander

The buttons that have the same name on the Remote Commander as on the camcorde function identically.



1 **Transmitter**
Point toward the remote sensor to control the camcorder after turning on the camcorder.

2 **Video control buttons** (p. 19)

3 **DISPLAY button** (p. 19)

4 **START/STOP button** (p. 11)

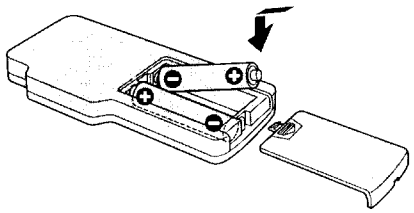
5 **Power zoom button** (p. 14)

Notes on the Remote Commander

- Keep the remote sensor away from strong light sources such as direct sunlight or illumination. Otherwise, the remote control may not be effective.
- Be sure that there is no obstacle between the remote sensor on the camcorder and tl Remote Commander.
- This camcorder works in commander mode VTR 2. The commander modes (1, 2 ar 3) are used to distinguish this camcorder from other Sony VCRs to avoid remote control misoperation. If you use another Sony VCR in commander mode VTR 2, w recommend you change the commander mode or cover the remote sensor of the VC with black paper.

To prepare the Remote Commander

Insert two size AA (R6) batteries by matching the + and – on the batteries to the diagram inside the battery compartment.



Note on battery life

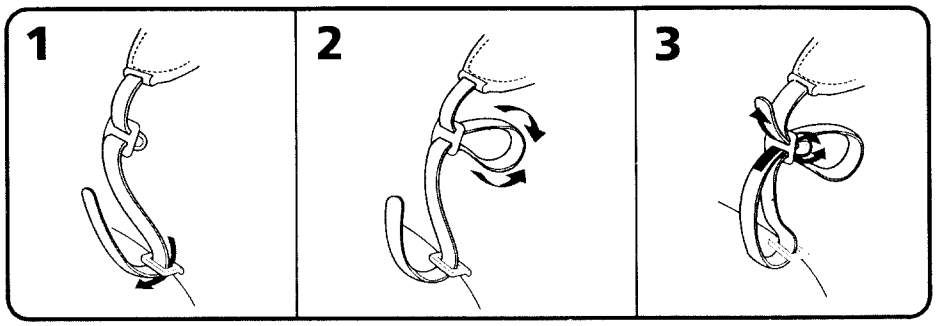
The batteries for the Remote Commander last about 6 months under normal operation. When the batteries become weak or dead, the Remote Commander does not work.

To avoid damage from possible battery leakage

Remove the batteries when you will not use the Remote Commander for a long time.

Attaching the shoulder strap

Attach the supplied shoulder strap to the hooks for the shoulder strap .



To watch the demonstration

You can start the demonstration by setting DEMO MODE in the menu system. You can also start the demonstration by the following operation. When NIGHTSHOT is set to ON, you cannot watch the demonstration.

To enter demo mode

(1) Eject the cassette and set the POWER switch to PLAYER.
(2) Turn STANDBY up to STANDBY.
(3) While holding down ► set the POWER switch to CAMERA.

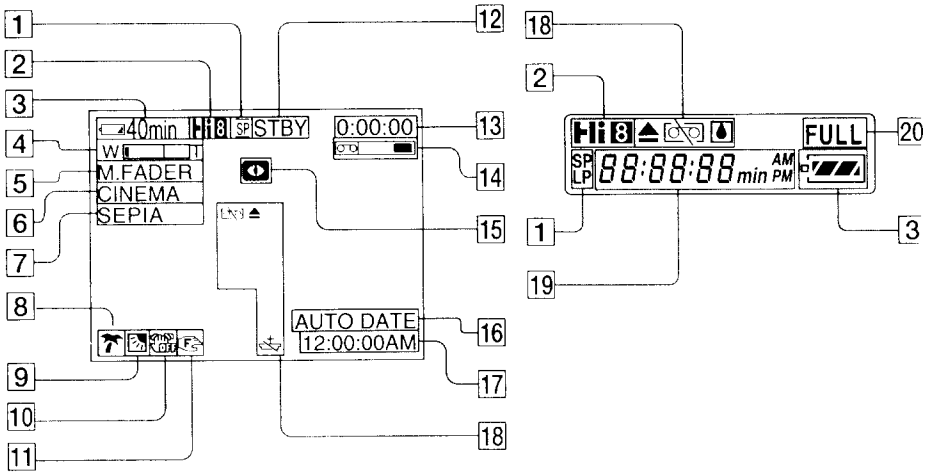
To exit demo mode

(1) Set the POWER switch to PLAYER.
(2) Turn STANDBY up to STANDBY.
(3) While holding down ■ set the POWER switch to CAMERA.

Operation indicators

Viewfinder

Display window



1 **Recording mode indicator** (p. 25)

2 **Playing back or recording in Hi8 format** (p. 54)

3 **Remaining battery time indicator**

4 **Exposure indicator** (p. 39)/ **Zoom indicator** (p. 14)

5 **FADER indicator** (p. 29)

6 **Wide mode indicator** (p. 31)

7 **PICTURE EFFECT indicator** (p. 38)

8 **PROGRAM AE indicator** (p. 34)

9 **Backlight indicator** (p. 27)

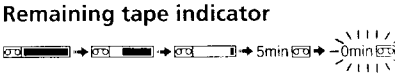
10 **Steadyshot off indicator** (CCD-TR716 only) (p. 48)

11 **Manual focusing** (p. 36)

12 **Standby/Recording mode indicator** (p. 11)/**Video control mode indicator** (p. 20)

13 **Tape counter** (p. 13)/**Self-diagnosis functions indicator** (p. 66)/**5SEC mode indicator** (p. 15)

14 **Remaining tape indicator**



15 **NIGHTSHOT indicator** (p. 30)

16 **AUTO DATE indicator** (p. 11)/**Date indicator** (p. 44)

17 **Time indicator** (p. 44)

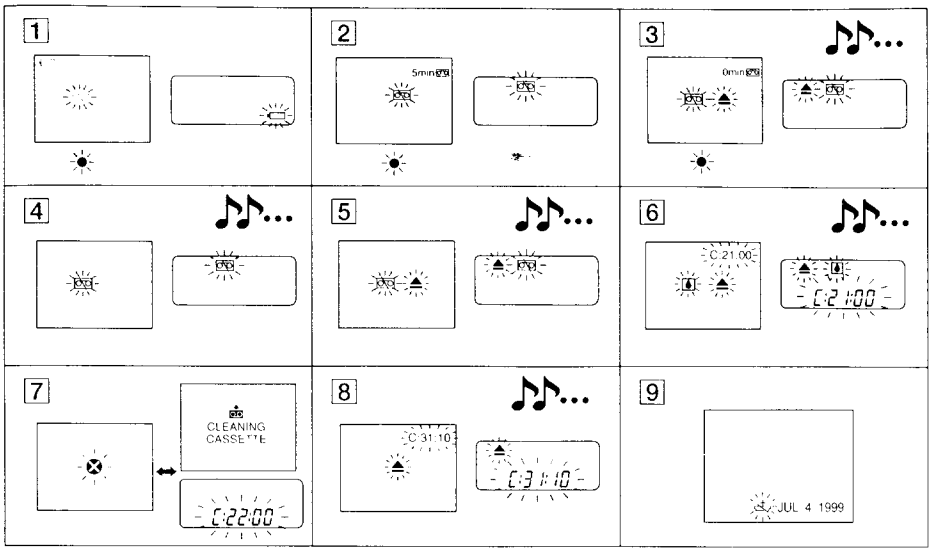
18 **Warning indicators** (p. 75)

19 **Date or time indicator** (p. 44)/**Tape counter** (p. 13)/**Self-diagnosis functions indicator** (p. 66)/**Remaining battery time indicator** (p. 7)

20 **FULL charge indicator** (p. 7)

Warning Indicators

If indicators flash in the viewfinder or in the display window, check the following:
♪♪... : you can hear the beep sound when the BEEP is set to ON.



1 **The battery is weak or dead.**
Slow flashing: The battery is weak.
Fast flashing: The battery is dead.

2 **The tape is near the end.**
The flashing is slow.

3 **The tape has run out.**
The flashing becomes rapid.

4 **No tape has been inserted.**

5 **The tab on the tape is out (red).**

6 **Moisture condensation has occurred.**

7 **The video heads may be contaminated.**

8 **Some other trouble has occurred.**
Use the self-diagnosis function (p. 66). If the display does not disappear, contact your Sony dealer or local authorized Sony service facility.

9 **The lithium battery is weak or is not installed.**

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